

ROMANIAN NAVAL ACADEMY “Mircea cel Batran”

**THE 47th SCIENTIFIC
CONFERENCE FOR STUDENTS
CADET-NAV 2025
PROGRAMME**



***08th - 10th of May 2025
CONSTANTA***

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Țipu Adelin-Sorin

Vasile Rareș-Andrei

Vasiliu Vlad-Remus

CONFERENCE AGENDA	
THE 47 th EDITION OF CADET-NAV 2025	
INTERNATIONAL STUDENTS' CONFERENCE	
08 - 10.05.2025	
Thursday, 08.05.2025	
08.00 - 12.00	Arrival of Participants, Admin Matters
12.00 - 14.00	Visit on campus
14.00 - 15.00	Lunch
15.00 - 17.00	Visit to the Romanian Navy Museum
17.00 - 20.30	Constanta Sightseeing City Tour
Friday, 09.05.2025	
08.30 - 09.30	Registration of participants; Distribution of conference maps - "Admiral Petre Barbuneanu" Auditorium
09.30 - 10.00	CADET-NAV 2025 Official Opening Ceremony
	Raising the Flag Ceremony
	Welcome Address of the Rector of Romanian Naval Academy "Mircea cel Batran"
10.00 - 11.00	Paper Presentations in Plenary:
	- Development of an In-House Integrated Platform for Real-Time Naval Mine Detection and Threat Forecasting in Support of NATO SeaShield 25 Operations via UAV-USV Collaboration – stud. Iustin Moroşan and stud. Gabriel Iosif, Scientific Advisors Lecturer Elena Graţia Robe, PhD, SR II Oana Marcu, PhD, Prof. Vasile Dobref, PhD, Romanian Naval Academy;
	- Analysis of the Stages of Voyage Planning in ECDIS – stud. Raluca – Gina Popa, Scientific Advisor Lecturer Livia Rauca PhD, Romanian Naval Academy;
	- The Impact of Weather Phenomena on the Human Psyche – stud. Cosmina Stăicuţ, stud. Mihai Crăciun, Lecturer Mihaela Guranda, "Henri Coanda" Air Force Academy, Brasov;
	- The virtual simulation of the Training Ship Mircea through 3D modelling – stud. Robert Andrei Pasarica, Scientific Advisors SRIII Alexandru Pintilie, PhD and Lecturer Elena Graţia Robe, PhD, Romanian Naval Academy.
11.00 - 11.30	Group Photo; Coffee Break
11.30 - 14.30	Paper Presentations on Sections (Navigation and Transport – Room L121, Engineering and Management – Room L120, Military Sciences and Information – Room LI 126, Electrical Engineering – Room LI 356, Weapons and Communications – Room LI 125, Mechanical Engineering – Room E122, Fundamental Sciences – Room Lp-A5, Foreign Languages – Room CI S3, Students' experiences in international exchanges – "Vice-admiral Ion Coanda" Auditorium)
	Lunch - "Admiral Petre Barbuneanu" Auditorium
Saturday, 10.05.2025	
10.00 - 12.00	Awards Ceremony
12.00	Departure of Participants

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I. SECTION: NAVIGATION AND TRANSPORT

Section Committee:

Chairman: Lecturer Dumitru CORDUNEANU, PhD

Members: Lecturer Lucian DUMITRACHE, PhD

Prof. assist. Livia RAUCA, PhD

Stud. Maria-Alexandra POP

Stud. Iaris-Gabriel MORARU

Stud. Valentina GRECU

Stud. Laura IORDAN

Room: L121

1. (ID 13) Study on Decision Making Under Conditions of Economic Certainty

Authors: stud. Nicușor-Constantin BAHRAIN, stud. Sebastian LANG

Scientific Advisor: Lecturer Daniel DANECI PATRAU, PhD

Institution: Maritime University Constanta

Abstract: *In the business environment of a business firm, several states of objective conditions may manifest themselves for a given decision-making situation. In countries with a market economy, the environment is characterized by frequent and rapid changes that induce disruptive factors in the management system and even in the managed one of the enterprises' activities. The internal and external conditions, characteristic of the enterprise, generate the framework within which the decision-maker acts through the information at his disposal. The influence of the environment within the enterprise is manifested on the decision through: the competence of managers at different hierarchical levels; the working methods and techniques used; the information system used within the enterprise; the degree of technical endowment or the level of applied technologies. The main goal of this article was to present the concrete way of making a decision regarding the choice of the optimal option in a shipping company, using the global utility method algorithm.*

Keywords: *decision, global utility, optimal option*

2. (ID 20) Analysis of the Stages of Voyage Planning in ECDIS

Author: stud. Raluca-Gina POPA

Scientific Advisor: Prof. assist. eng. Livia RAUCA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Voyage planning represents the process of creating a detailed presentation of the route that the ship will follow from port A to port B. This planning includes the departure of the ship from berth and leaving the port area, the actual voyage, the approach to the docking area, the arrival point, and the final destination. The responsibility for executing the voyage lies with the ship's captain. However, this task is often assigned to the second officer, who is responsible for navigation onboard the commercial vessel. Research has shown that 80% of maritime accidents are caused by human error, though these can still be prevented. The preparation of the voyage has evolved over the years, starting from being carried out on paper charts, to the present day, where the voyage is electronically monitored in ECDIS.*

Voyage planning includes the following steps:

1. *Appraising*
2. *Planning*
3. *Executing*
4. *Monitoring*

Keywords: *Voyage, ship, ECDIS, navigation, planning.*

3. (ID 30) The Impact of Modern Technology on Combating Maritime Piracy and the Evolution of Attack Tactics in the Digital Age.

Author: stud. Cosmin MAZILU

Scientific Advisor: Instr. sup. eng. Andrei POCORA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The impact of modern technology on combating maritime piracy has significantly transformed security operations and tactics in the digital age. Advanced technologies, such as satellite surveillance, drones, and artificial intelligence, have enabled more efficient monitoring of high-risk areas and real-time response to piracy incidents. The evolution of cyber warfare has also introduced new vulnerabilities, as pirates increasingly employ digital methods to track vessels and disrupt communication systems. This shift has*

prompted the development of more sophisticated countermeasures, enhancing the safety of maritime trade. However, these technological advancements have also led to evolving piracy tactics, requiring continuous adaptation of defense strategies.

Keywords: *Modern technology, combating piracy, Maritime security, Satellite surveillance, Drones, Artificial intelligence, Cyber warfare, Evolving piracy tactics*

4. (ID 31) Wellboat-The Live Fish Carrier

Author: stud. Bogdan BALUSE

Scientific Advisor: Instr. sup. eng. Andrei POCORA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *A wellboat, also known as a live fish carrier, is a specialized vessel designed for the transportation of live fish, primarily used in the aquaculture and fishing industries. This presentation explores the role, structure, and operational mechanisms of wellboats, focusing on their significance in ensuring the efficient and humane transfer of live fish while maintaining optimal water quality and minimizing fish stress. This presentation will highlight the technological innovations that have enhanced wellboat operations over time, including automated systems for water purification, biomass counting, and gentle loading and unloading processes. Case studies will be presented to illustrate the real-world applications and efficiency of wellboats in modern aquaculture. In conclusion, the wellboat represents a critical link in the aquaculture supply chain, contributing to the sustainable growth of the seafood industry by enhancing fish welfare, reducing operational costs, and promoting environmentally responsible practices.*

Keywords: *wellboat, fish carrier, special transportation, environmental protection*

5. (ID 33) Development of an advanced navigation system using high precision GPS

Authors: stud. David-Andrei MOLOAGA, stud. Alexandru-Ioan GAVRIL

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The project proposes the development of an advanced navigation system, based on the use of high-precision GPS, intended to improve the accuracy and safety of travel in various environments, including land, sea and air transport. The main goal of this project is to create an innovative solution that allows highly accurate navigation, reducing location errors and optimizing routes in real time, by integrating state-of-the-art technologies. The system will use high-precision GPS combined with advanced data processing algorithms and environmental sensors to provide accurate and continuously updated location and route information. It will also include capabilities to automatically adjust the route based on traffic conditions, weather or other external variables, providing users with an adaptive and reliable navigation experience. In addition, the system will include enhanced safety features such as real-time warnings for obstacles or dangerous areas, thus helping to reduce risks and increase the efficiency of transport operations. The objective of the project is not only to optimize trips, but also to minimize fuel consumption and the impact on the environment, by choosing the most efficient routes. Thus, by developing this advanced navigation system, it will contribute to the transformation of the way in which travel is managed and carried out, offering an innovative, precise and sustainable solution for a wide range of applications.*

Keywords: *system navigation, GPS, precision*

6. (ID 34) Innovative Solutions for the Improvement and Efficiency of Navigation Systems

Authors: stud. Mihai Alexandu-Ioan GAVRIL, stud. David-Andrei MOLOAGA

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In the context of accelerated technological development, navigation systems play a crucial role in numerous fields, from land and sea transportation to aviation and personal navigation. The project proposes the development of innovative solutions for the creation and efficiency of these systems, with the aim of responding to the current challenges related to the precision, safety and efficiency of navigation. Proposed solutions include the integration of advanced technologies such as state-of-the-art GPS,*

environmental sensors, artificial intelligence and real-time data analysis. They will make it possible to create predictions of automatic adjustment of itineraries according to weather traffic conditions, as well as early detection of possible dangers. Emphasis will also be placed on optimizing energy and fuel consumption through more efficient routes, thus contributing to reducing the impact on the environment. The innovative solutions will be implemented in an intelligent navigation platform, with an easy-to-adapt interface and able to use the function of the user's needs. These technologies will help increase safety and efficiency, reducing accident risks and facilitating a faster and more accurate navigation experience. The project aims to create a reliable, sustainable and high-performance navigation system that meets the requirements of a dynamic and constantly changing environment.

Keywords: *state-of-the-art GPS*

7. (ID 40) Interpersonal Relationships Aboard a Ship

Author: stud. Xandra Andreea BESLIU

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this project, I analyzed interpersonal relationships on board the ship, focusing on cooperation, competition and conflict management. I highlighted the crucial role of cooperation in the efficiency of naval operations and proposed practical strategies, such as clear communication and effective leadership, to strengthen it. I also studied the impact of healthy competition, which, if well managed, can boost motivation and improve team performance. To prevent conflicts, it is essential to identify their sources and use open communication. I proposed concrete solutions, such as organizing team meetings, developing an environment based on mutual respect and making balanced decisions to maintain harmony. Through this analysis, I have demonstrated that a united and collaborative crew is the key to success in the maritime environment, especially in the face of its specific challenges.*

Keywords: *Communication, leadership, competition, harmony.*

8. (ID 50) Study on The Sar (Search and Rescue) System in Great Britain

Author: stud. Dragoș IVANOV

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Search and Rescue (SAR) operations are essential for saving human lives and providing assistance in emergency situations. These systems are crucial in various contexts, including natural disasters, maritime accidents, and urban emergencies. The effectiveness of SAR operations relies on well-coordinated efforts by specialized personnel, advanced technologies, and strategic planning. This paper provides an overview of the components, phases, trends and future challenges of the SAR system, emphasizing their importance in protecting human lives. The primary objective of this study is to analyze the technological, operational and collaborative frameworks of the SAR system in the United Kingdom. By identifying existing challenges and assessing the effectiveness of current SAR protocols and success rates of SAR missions. This thesis will evaluate the United Kingdom's coordination with SAR networks, which is essential for managing large-scale emergency.*

Keywords: SAR Marea Britanie

9. (ID 53) Artificial Intelligence in Collision Avoidance at Sea

Authors: stud. Alexandru LAZAR, stud. Romica Stefan BIBICU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Artificial Intelligence (AI) plays an increasingly important role in maritime navigation, significantly contributing to collision prevention. By integrating sensors, radar, and machine learning algorithms, AI systems can detect hazards in real time and suggest alternative routes. This greatly enhances the efficiency and safety of maritime transport.*

10. (ID 76) Methods and equipment used to combat hypothermia

Authors: stud. Mihai SASU, stud. Stefan Alexandru GÎNGU, stud. Robert Gabriel MEIANU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: Hypothermia is a medical emergency that occurs when the body loses heat faster than it can produce it, causing a dangerously low body temperature. This condition can lead to serious health complications or death if not treated promptly. To combat hypothermia, various methods and equipment are employed, ranging from passive techniques like insulating clothing and blankets, to active external warming devices such as heated pads, forced-air warming systems, and warm water immersion. In severe cases, core rewarming techniques like warmed intravenous fluids, humidified oxygen, and extracorporeal blood warming may be necessary. The choice of method depends on the severity of hypothermia and available resources. Proper use of these methods and tools is crucial in pre-hospital and clinical settings to ensure patient safety and recovery.

11. (ID 83) Study on Plastic Pollution and Its Influence on Ocean Dynamic

Author: stud. Viorela-Petronela FLOREA

Scientific Advisor: Lieutenant Lecturer Andra NEDELCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: This study analyzes the impact of plastic pollution on oceans and explores solutions for its reduction. It examines how plastic affects marine ecosystems and ocean dynamics, identifying its sources, effects, and the need for protective measures. The study addresses the origin and distribution of plastic waste, its disruptive impact on ocean currents and biodiversity, and highlights global accumulation zones through a case study. Finally, it proposes prevention strategies, innovative cleanup technologies, and international policies to combat plastic pollution and safeguard marine environments.

Keywords: pollution, effects, currents, biodiversity

12. (ID 87) Leadership Styles in Maritime Transport: A Critical Analysis

Authors: stud. Alina-Mihaela PREDA, stud. Lorena-Andreea OATU

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *We chose this topic because leadership plays a crucial role in ensuring safety, efficiency, and teamwork in maritime operations, and every navigator should understand its impact. Leadership is essential in maritime transport, from historical voyages to modern shipping. The term "leadership" derives from guiding and inspiring others, reflecting its role in achieving common goals. Maritime operations have evolved to prioritize collaboration and safety, with modern captains often blending democratic and authoritarian styles to adapt to daily routines and emergencies. However, in crisis situations, leadership becomes even more critical. Without strong guidance, as seen in the Costa Concordia disaster, chaos can ensue. In conclusion, effective leadership remains indispensable in maritime transport, ensuring coordination, motivation, and safety. Even with advanced technology, the human element of leadership continues to be the cornerstone of successful navigation.*

Keywords: *leadership styles, maritime transport, authoritarian, transformational, democratic, laissez-faire*

13. (ID 88) The Peculiarities of Naval Transport of Oversized Goods Using Flat Rack Containers

Author: stud. Vladut Ionuț DRAGOMIR

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The maritime transport of oversized cargo presents a major challenge due to their size and weight. The use of flat rack containers for this type of transport provides effective solutions for handling and transporting cargo that cannot be shipped in a standard container. These containers are designed to support large and unusually shaped items, equipped with sturdy metal structures that allow the cargo to be secured and protected. The advantages of using flat rack containers include flexibility in loading and unloading goods, reduced risk of damage, and operational efficiency in logistics. However, oversized transport also presents a series of challenges, such as the need for specialized equipment for handling, higher costs, and strict regulations regarding transport routes and permits.*

Keywords: *maritime transport, Flat Rack, oversized cargo, cargo handling*

14. (ID 89) Blockades, Sanctions and Alternate Routing. International Commerce in the Era of Conflict

Author: stud. Vlad-Mihai CHELU

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Wars and geopolitical tensions around the world in the last few years remodeled international commerce in a profound and visible way affecting everything from logistical chains to commercial routes and even everyday costs for food, energy and tech. The rivalry between major powers the likes of the United States or China has accentuated the overall tendency for fragmentation on the international market while also anticipating the end of the globalized world we are living in. The Russian-Ukrainian conflict also had a historical impact on a local and global level, forcing companies to reroute traditional commercial routes. This paper is analyzing the impact of these events and phenomena by emphasizing the different strategies states and companies have been experiencing with to try to cope with the new geopolitical realities we are already living in.*

Keywords: *international commerce, multimodal transport, Russo-Ukrainian War, China, sanctions, geopolitics*

15. (ID 92) End of the Unipolar World? USA, China and the New Economic Order

Authors: stud. Vlad-Mihai CHELU, stud. Claudiu Emilian CURCA

Scientific Advisor: Lecturer eng. Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This article is examining the shifting dynamics of the global power in the 21st century with a focus on the decline of the unipolar world that has been dominated by the United States, while also discussing the concurrent rise of China as a central actor in the emerging multipolar landscape. We are exploring the historical roots of the American hegemony post-Cold War, the strategic economic policies behind China's awakening and the growing influence that new and emerging global institutions and alliances like BRICS are projecting outside of the traditional Western-led framework. Through an analysis of trade relations, technological competition and geopolitical strategies this article is trying to evaluate whether the global system is undergoing a rough and structural transformation*

towards multipolarity or if it is just a temporary trend. The implications of such a possible shift would not go unobserved and should be discussed further in the context of global governance, economic stability and the potential redefinition of international norms beyond the 2020s.

Keywords: *unipolarity, multipolar world, United States, China, brics, geopolitics, power transition, trade, policy, strategic competition, international relations, economic order*

16. (ID 96) Security and risk management in maritime transport of LNG

Author: stud. Cristian-Mihai CHIVU

Scientific Advisor: Lecturer Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maritime transport of liquefied natural gas (LNG) is a key component of the global energy supply chain but involves numerous risks and requires strict security measures. This paper analyzes the main threats associated with LNG transport, including technical failures, human errors, and potential cyber or terrorist attacks. It also evaluates modern risk management methods such as real-time monitoring systems, international safety protocols, and crew training. Through an integrated risk management approach, a high level of operational safety and marine environmental protection can be ensured. The study highlights the need for international collaboration and continuous regulatory updates to address emerging challenges in the field.*

Keywords: *LNG, security, risks, maritime transport, operational safety, management, regulations*

17. (ID 99) Crew Safety Rules on Board the Ships

Authors: stud. Theodor-Ionuț SARCU, stud. Alex-George CIREASA

Scientific Advisor: SR3 Eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The safety of the crew on board a ship is an essential aspect in its operation, given the complexity and risks associated with activities carried out at sea. Safety rules are established to protect crew members against accidents and emergencies such as*

fires, shipwrecks or extreme weather conditions. These rules are regulated by international bodies such as the International Maritime Organization (IMO) and international conventions such as SOLAS (Safety of Life at Sea), which stipulate clear measures for crew training, personal protective equipment, evacuation and protection procedures, and periodic checks of safety equipment. In this context, it is essential that the crew is properly trained and able to react quickly and efficiently to any incidents. Also, the regular recording and analysis of incidents and accidents on board is crucial for the continuous improvement of safety rules and procedures. Their correct implementation contributes not only to the physical protection of the crew, but also to the prevention of accidents and the protection of the marine environment. This study focuses on essential regulations, safety procedures and the importance of crew training in ensuring a safe and efficient working environment on ships.

Keywords: *safety, crew, ship*

18. (ID 197) The loading and discharging installation of an oil tanker

Author: stud. Alexandru Cătălin DRAGULIN

Scientific Advisor: Lecturer Eng. George NOVAC, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The loading and discharging installation of an oil tanker is a critical system designed to safety and efficiently transfer liquid cargo, such as crude oil or refined petroleum products, between the ship and shore facilities. This system includes cargo pumps, pipelines, valves, and manifolds, all of which are integrated into the ships structure. During loading, oil is transferred from shore tanks to the vessel through flexible hoses or loading arms, using gravity or pumps. During discharging, onboard pumps push the cargo ashore. Safety is a top priority, with systems in place to prevent spills, overpressure, or explosions, including inert gas systems, emergency shutdown valves, and grounding to prevent static electricity. Efficient operation requires close coordination between ship and terminal crews, strict adherence to international regulations (such as MARPOL), and constant monitoring of pressure and flow. The entire process is controlled from the cargo control room, ensuring smooth, safe, and environmentally responsible operations.*

Keywords: *Loading and Discharging Installation of Framo Pumps*

19. (ID 198) Requirements and Strategic Directions for the Development of Port Infrastructure

Author: stud. David-Ciprian CHIRICA

Scientific Advisor: Lecturer eng. Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes the current state, challenges, and future development needs of port infrastructure in the context of increasing global trade and technological advancements. It outlines key requirements for modernization, including digitalization, sustainability, and intermodal connectivity. Furthermore, the study proposes strategic directions to enhance the efficiency, resilience, and competitiveness of port facilities, supporting both national economic growth and international integration.*

Keywords: *port infrastructure, development needs, modernization*

20. (ID 199) "The Study of Romania's International Trade: Statistical Analysis for the Period 2000–2025"

Author: stud. Antonia-Andreea MIRLENEANU

Scientific Advisor: Lecturer Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This powerpoint explores the evolution of Romania's international trade from 2000 to 2025, focusing on both economic trends and transport infrastructure. It begins with an overview of Romania's geographical position and role within the European Union. The analysis highlights significant growth in exports and imports over the 25-year period, along with a consistent trade deficit. Special attention is given to trade conducted via inland waterways, particularly the Danube River, as well as maritime transport through the Port of Constanța. The study also addresses current challenges such as infrastructure gaps and administrative barriers, while outlining future perspectives driven by EU investment and green transition goals. Overall, the research emphasizes the strategic role of transport in enhancing Romania's global trade performance.*

Keywords: *Romania International Trade Exports and Imports Trade Balance Inland Waterway Transport Maritime Transport Danube River Port of Constanța Economic Development Transport Infrastructure*

21. (ID 200) A Study on the Display of Information on Electronic Navigational Charts (ENCs)

Authors: stud. Denis SEITCEA, stud. Maria Gabriela TEOFAN

Scientific Advisor: Prof. assist. Livia RAUCA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The transition from traditional paper charts to Electronic Chart Display and Information Systems (ECDIS) has significantly transformed maritime navigation. This paper explores the way navigational information is displayed on electronic charts and the impact this has on navigational safety, efficiency, and situational awareness. By analyzing the design principles behind ECDIS interfaces, including the layering of data such as AIS, radar overlays, and route monitoring, the study highlights how ergonomic and intuitive displays can enhance the decision-making process on the bridge. The paper also addresses common display-related issues and proposes potential improvements in the context of modern and future navigation systems.*

Keywords: *ECDIS, Electronic Navigational Charts (ENCs), Maritime Navigation, Information Display, User Interface Design*

22. (ID 201) Bridging the Skies and Seas

Authors: stud. Narcis MANEA, stud. Matei JARDA

Scientific Advisor: Capitan Prof. Assist. George AIONESEI

Institution: Academia Fortelor Aeriene "Henri Coanda"

Abstract: *Navigation plays a vital role in both maritime and aerial operations, ensuring the safe movement between two points by taking into account various factors such as environmental conditions, physical obstacles, and onboard technologies. Over time, the methods and tools used to guide vessels and aircraft have become increasingly accurate, reflecting a continuous process of technological refinement and adaptation. This project explores the evolution and interconnection of maritime and air navigation systems, focusing on their similarities, differences, and the continuous exchange of technological advancements between the two domains. By analyzing the historical development of these systems, the study emphasizes how innovations in one field have often been adopted and adapted by the other, leading to improvements in both air and sea transport. The research also investigates the existing*

gaps and vulnerabilities in current navigation systems, stressing the importance of continuous innovation, better integration, and enhanced collaboration between the two sectors. Furthermore, the project examines how emerging technologies, particularly artificial intelligence, could play a crucial role in optimizing navigation systems, enhancing safety, and reducing risks in both maritime and air sectors. By using AI for real-time data analysis and decision-making, the goal is to improve efficiency, accuracy, and overall operational effectiveness in global transport. This study offers a foundation for future research in the field of navigation, emphasizing the importance of embracing technological innovation to overcome current limitations and better prepare both sectors for the demands of modern transport.

Keywords: *Navigation systems, Maritime navigation, Air navigation, Technological innovation, Artificial intelligence in navigation, Navigation system vulnerabilities, Historical development of navigation, Risk reduction in transport.*

23. (ID 204) Studies on Temporary and Preliminary Corrections on the Electronic Chart

Authors: stud. Ionuț Robert GAVRILĂ, Marian Emanuel VASILE

Scientific Advisor: Prof. assist. Livia RAUCA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The accuracy and reliability of electronic navigational charts (ENCs) are essential for ensuring the safety of maritime navigation. This study explores the implementation and significance of temporary and preliminary corrections within Electronic Chart Display and Information Systems (ECDIS). Temporary corrections refer to short-term changes affecting navigation, such as obstructions or temporary buoyage, while preliminary corrections address pending updates based on unconfirmed or early-stage hydrographic data. The paper analyzes the procedures through which these corrections are issued, integrated, and displayed on ECDIS, emphasizing their role in real-time situational awareness and risk reduction. By evaluating current practices and potential shortcomings, the study highlights the need for continuous improvement in the digital correction process and increased awareness among navigators.*

Keywords: *Electronic Chart Display (ECDIS), Chart Corrections, Temporary Corrections, Preliminary Corrections, Navigational Safety, Maritime Navigation ENC Updates (Electronic Navigational Chart Updates)*

24. (ID 206) Determination of the Closest Point of Approach (CPA) and the Time to Closest Point of Approach (TCPA)

Authors: stud. Madalina Antonela COSTAN, stud. Tiberiu Ștefan SERBU

Scientific Advisor: Prof. assist. Livia RAUCA, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The ability to determine the Closest Point of Approach (CPA) and the Time to Closest Point of Approach (TCPA) is critical for safe and effective navigation at sea. These two parameters are used to evaluate the risk of collision between vessels by analyzing their relative motion. This study examines the mathematical principles and navigational tools involved in calculating CPA and TCPA, with a focus on radar systems and Automatic Identification System (AIS) data. The paper highlights the importance of timely and accurate CPA/TCPA assessment in decision-making processes, enabling the navigator to take early action to avoid potential hazards. Furthermore, it explores real-life scenarios to demonstrate how CPA and TCPA contribute to safe voyage planning and traffic management in congested maritime areas.*

Keywords: *Closest Point of Approach (CPA) Time to Closest Point of Approach (TCPA) Collision Avoidance Radar Plotting Target Tracking Navigational Safety Maritime Navigation Vessel Traffic*

25. (ID 207) Navigation and Transport

Authors: stud. Ilie-Răzvan TRIFU, stud. Karina-Ilinka UȚĂ-PREDA, stud. Alexia-Larisa DUMITRAȘ

Scientific Advisor: Major Ana Maria MERLUȘCĂ

Institution: "Carol I" National Defence University

Abstract: *Navigation and transport are fundamental components of military capability, especially within naval operations, where strategic mobility, maritime security, and logistical efficiency are critical. In the case of the Romanian Naval Forces, these elements have become increasingly important in the context of regional*

security dynamics in the Black Sea, NATO interoperability, and the modernization efforts undertaken in recent decades. This article analyzes the evolution of navigation and transport within the Romanian Naval Forces, focusing on the integration of advanced navigation systems, fleet modernization, and the development of maritime infrastructure. The study explores how Romania has adapted its naval logistics and operational mobility to align with contemporary defense requirements, including the implementation of digital navigation technologies, satellite-based positioning systems, and real-time communication platforms. Special attention is given to the challenges and opportunities faced by the Romanian Navy in maintaining secure maritime transport routes, participating in multinational exercises, and contributing to NATO missions. The research also addresses the role of military transport in crisis response, humanitarian assistance, and defense diplomacy. Furthermore, the paper evaluates the strategic importance of the Danube River and the Black Sea region, emphasizing the need for resilient transport corridors and robust naval infrastructure to support both national and allied operations. By adopting an interdisciplinary approach that incorporates aspects of military strategy, naval engineering, and geopolitical analysis, this study provides a comprehensive understanding of how navigation and transport contribute to the operational readiness and strategic posture of the Romanian Naval Forces in the 21st century.

Keywords: *navigation systems, naval logistics, defense infrastructure, maritime transport corridors*

26. (ID 208) Study on the Organization and Management of Firefighting Operations on Board a 19,000 TEU Container Ship

Author: stud. Alex-Claudiu HERLEA

Scientific Advisor: Lecturer Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The International Maritime Organization (IMO) has implemented significant updates to the SOLAS regulations to address concerns about fire safety on container ships carrying large quantities of containers, whether in open areas or on the upper deck. By adopting resolution MSC.365(93) in May 2014, SOLAS Regulation 10, which focuses on fire prevention, was amended to*

enhance methods for containing fires at their source and cooling nearby areas to prevent fire spread and structural damage to ships. Starting from January 1, 2016, newly built ships designed to transport containers on or above exposed decks are required to include water mist lances. These devices are specifically designed to pierce container walls and disperse a fine mist of water inside, effectively limiting fire expansion. Ships transporting five or more layers of containers on the upper deck must also be equipped with mobile water monitors. The number of monitors required depends on the ship's width: at least two for ships less than 30 meters wide and a minimum of four for ships 30 meters wide or larger. To ensure these systems function effectively, an adequate number of hydrants must be installed, allowing the simultaneous operation of the monitors while maintaining a sufficient water flow to combat fires on the upper layers of containers. Document MSC.1/Circ.1472 provides additional guidelines on the design, performance, and testing of such mobile water monitors. Although these requirements primarily target newly built vessels, similar measures may eventually be adopted for existing ships, either through future regulations or voluntary initiatives by shipowners prioritizing onboard safety.

27. (ID 209) Breaking the Chain: Combating Organized Crime in the Black Sea

Author: stud. Florin BRĂDEAN

Scientific Advisor: Military Instructor captain Sorin LICA

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *The Black Sea region has emerged as a critical hotspot for organized crime, serving as a conduit for various illicit activities, including human trafficking, arms smuggling, and narcotics trade. These transnational criminal networks exploit regional vulnerabilities such as porous borders, political instability, and weak maritime governance. This paper examines the evolving dynamics of organized crime in the Black Sea, with particular attention to the structural and operational patterns of human trafficking networks. It critically assesses the current law enforcement responses among littoral states and highlights the limitations of fragmented national efforts in addressing transfrontier criminality. Emphasis is placed on the role of international cooperation in building a coordinated*

regional security framework. Drawing from successful case studies, maritime surveillance strategies, and multilateral initiatives, the paper proposes a set of actionable recommendations to enhance law enforcement capacity, strengthen cross-border intelligence sharing, and promote legal harmonization. Ultimately, the study argues that breaking the chain of organized crime in the Black Sea requires a shift toward sustained regional engagement, integrated policy development, and joint operational mechanisms. Such efforts are essential to restoring stability and ensuring the long-term security of the Black Sea maritime domain.

Keywords: *Organized Crime, Human Trafficking, Law Enforcement, International Cooperation*

28. (ID 213) Unseen Voyagers: The spread and Impact of Invasive Species via Ballast Water in Southeast Asian Waters

Author: stud. Maria-Cătălina POPA

Scientific Advisor: Captain Assoc. Prof. eng. Dinu ATODIRESEI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The discharge of ballast water from commercial vessels has become a leading pathway for the global spread of invasive aquatic species. These „unseen voyagers” often go until they cause severe disruptions to marine ecosystems and coastal economies. This project focuses on the socio-economic and ecological consequences of such invasions in Southeast Asia – a region highly vulnerable due to dense marine traffic and diverse ecosystems. Invasive species such as *Pomacea canaliculata*, *Caulerpa taxifolia* and *Mytilopsis sallei* have damaged coral reefs, aquaculture and rice farming in countries like the Philippines, Vietnam and Indonesia. The study examines how ballast water contributes to these invasions and reviews the effectiveness of regional implementation of existing international regulations, including IMO Ballast Water Management Convention. Emphasis is placed on improving monitoring systems, harmonizing enforcement among ASEAN nations, and raising awareness among maritime operators. The project underlines the importance of regional cooperation to mitigate long-term ecological and economic impacts.*

Keywords: *Invasive species, ballast water, Southeast Asia*

29. (ID 224) ISM code Implementation. SOPEP Code

Author: stud. Roberta-Mihaela CONSTANTIN

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper analyzes the implementation process of the International Safety Management Code (ISM Code) and the development of the Shipboard Oil Pollution Emergency Plan (SOPEP), two essential tools in the management of safety and environmental protection in the international maritime industry. The main objective of the ISM Code, issued by the International Maritime Organization (IMO) and integrated into the SOLAS Convention, is to establish a uniform standard for the safe operation of ships and the prevention of marine pollution by introducing a Safety Management System (SMS) that is functional, verifiable and tailored to the specifics of each ship and shipping organization. The implementation of the ISM Code requires the management company or ship operator to take responsibility for compliance with minimum operational safety requirements, training of personnel, risk assessment, periodic review of procedures and documentation of all relevant activities. Compliance with ISM also includes internal and external audits, regular inspections and certification of the ship through documents such as the Document of Compliance (DOC) and the Safety Management Certificate (SMC). To complement this system, the SOPEP Plan shall act as an operational and legal guide for the crew in the event of an oil pollution incident. It has extensive emergency response procedures, on-board location of anti-pollution equipment, alerting procedures to the competent authorities and measures to reduce the impact on the marine environment. The arrangement is obligatory for all vessels with a gross tonnage of 400 GT or more and has been formulated pursuant to the standards of MARPOL Annex I. By the synergic and comprehensive use of the ISM Code and the SOPEP Plan, shipping organizations ensure not only compliance with international regulations, but also organizational prevention-based culture, operating efficiency and preservation of the sea environment. The article stresses the inter-connection between such tools, the importance of human resource training and technical challenges incurred by the process on board new generation merchant vessels.*

Keywords: *safety, regulations, shipping, code, convention, management, compliance*

30. (ID 226) Study on the Use of Modern Technologies in Maritime and River Traffic Monitoring.

Author: stud. Anca-Ionela DOBROMIRESCU

Scientific Advisor: Captain Assoc. Prof. eng. Sergiu LUPU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores the application of modern technologies in the monitoring of maritime as well as river traffic, focusing on the integration of revolutionary systems for improving safety, efficiency, and environmental protection. The research examines the role of technologies such as certain Automatic Identification Systems (AIS), radar, satellite monitoring, and drone surveillance in real-time tracking and management of waterborne vessels. It evaluates how well these technologies reduce collision risks. It also evaluates improving traffic management, and providing situational awareness for maritime authorities. Furthermore, the study goes on to investigate all of the challenges that are faced in the implementation of these technologies in both commercial and recreational sectors, also highlighting the need for a collaborative approach among all stakeholders. The findings stress much of the importance of continuous technological advancements and of their potential for transforming water traffic monitoring into a more sustainable and more secure activity.*

Keywords: maritime traffic, river traffic, monitoring technologies, AIS

31. (ID 231) The Evolution of Maritime Navigation Systems: From Traditional Technologies to Smart Solutions

Author: stud. Emir SALI

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maritime navigation has undergone a profound transformation, evolving from traditional techniques based on celestial observations, magnetic compasses, and paper charts to highly advanced, smart technologies. This paper explores the historical and technological trajectory of navigation systems, highlighting key milestones from the use of the sextant and gyrocompass to the adoption of GPS, AIS (Automatic Identification System), and integrated smart solutions powered by artificial*

intelligence and big data analytics. In the context of global maritime expansion and increasing traffic density, modern navigation systems enhance operational efficiency, safety at sea, and environmental sustainability. Emerging trends such as autonomous navigation, predictive routing, and the integration of IoT sensors are also examined, illustrating how digital innovation is redefining the principles of maritime orientation and vessel control. This overview offers insight into the ongoing shift toward smarter, more connected maritime navigation infrastructures.

Keywords: navigation evolution, smart maritime solutions, GPS, big data

32. (ID 239) The Development of a New Roller Track Gravity Gate for Self-Unloader Bulk Carriers

Author: stud. Robert Alexandru SECUIU

Scientific Advisor: Prof. assist. Livia RAUCA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The study leads to the design of the new improved type of Roller Track Gate (RTG), for the gravity type Self-unloading Bulk Carriers (SULS) the Multi-functional Roller Track Gate (MRG). The self-unloading bulk carriers (SULS) are a specific type of dry bulk carriers since the ships discharge their cargoes without the use of external means.*

Keywords: new type of roller track gravity gate for bulk carriers

33. (ID 244) The decision-making process on-board commercial ships

Authors: stud. Robert Gabriel SANDU, stud. Nicolae Cristian STAN

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation delves into the decision-making process on-board commercial ships, breaking it down into four critical phases: problem identification, information analysis, option selection, and implementation with evaluation. It emphasizes the importance of data-driven choices, emotional intelligence, and adaptability in both personal and professional contexts. A central case study drawn from a free Harvard Business School online course*

(HBS Online), examines Ernest Shackleton's 1914–1917 Antarctic expedition, a landmark example of leadership in crisis. When his ship, Endurance, was trapped and destroyed by ice, Shackleton shifted focus from exploration to survival, demonstrating resilient leadership. His actions, prioritizing team morale, adapting to extreme uncertainty, and fostering open communication. The presentation references Shackleton's famous recruitment ad ("Men Wanted for Hazardous Journey") to highlight traits like courage and shared purpose. Key lessons include the importance of decisive action as echoed by Theodore Roosevelt's quote, risk mitigation, and learning from failure.

Keywords: *decision-making, leadership, resilience, crisis management, adaptability, Ernest Shackleton, emotional intelligence, transformational leadership, risk assessment, teamwork*

34. (ID 249) Navigation Safety in Areas with Heavy Traffic

Authors: stud. Hakan REFIGEAN, stud. Constantin-Laurențiu CAZACU

Scientific Advisor: Lecturer eng. Lucian DUMITRACHE, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Safety in navigation is defined as the safety of life, health and property against operational risks associated with the environment and navigation. This concept has evolved over time, its importance increasing significantly in recent times. Due to changes in maritime transport and the environment, today special attention is paid to maritime safety and navigation. The present paper looks at navigational safety in areas with heavy traffic. It highlights key risk factors, the importance of traffic management systems, and the role of modern navigational tools in preventing accidents.*

Keywords: *Navigation, Safety, Traffic*

35. (ID 250) Canada's International Trade

Author: stud. Izabela-Alexandra OȚELEA

Scientific Advisor: Lecturer Dumitru CORDUNEANU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The present paper explores Canada's international trade dynamics, focusing on the country's major trading partners, key export and import commodities, and the economic policies that*

influence trade flows. Canada's trade is heavily integrated with the global economy, particularly through its strong relationship with the United States, as well as increasing ties with the European Union and Asia-Pacific regions.

Keywords: *Trade, International, Import, Export*

36. (ID 252) Decreasing Ship Pollution Using the Latest Methods

Authors: stud. Allen ALI, stud. Andrei DASCĂLU

Scientific Advisor: Lecturer Eng. George NOVAC, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Ship trade represents around 80% of the global trade, according to the UNCTAD (United Nations Conference on Trade and Development), and continues to grow. Therefore, the shipping industry plays a significant role in maritime pollution and climate change by emitting toxic pollutants. This paper aims to analyze advances and innovations in international efforts to combat marine pollution.*

Keywords: *Shipping, Marine Pollution, Climate Impact, Emission*

37. (ID 258) Unlocking the Suez Canal: A Passage Through History

Authors: stud. Maria-Adelina VLAD, stud. Laurențiu-Mihai MEIANU

Scientific Advisor: Lecturer eng. Lucian DUMITRACHE, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This project is about the Suez Canal, a very important waterway that connects the Mediterranean Sea to the Red Sea. It helps ships travel faster between Europe and Asia without going all the way around Africa. The project explains how the canal was built, why it is important for world trade, and how it helps Egypt's economy. It also talks about big events like when a ship got stuck in 2021 and how Egypt improved the canal in 2015 to let more ships pass through. The Suez Canal plays a big role in international trade and will stay important in the future.*

Keywords: *Suez Canal, global shipping, Ever Given*

38. (ID 259) Navigating Pollution Control: Oil Tankers and Maritime Regulations

Authors: stud. Isabela-Gabriela BĂDILĂ, stud. Andreea-Diana CROITOR

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation explores the complexities of oil transportation and its environmental implications. Highlighting significant oil spills, such as the Exxon Valdez disaster, it delves into the causes and consequences of maritime accidents. International efforts, including MARPOL regulations, have driven advancements like double-hull tankers and crude oil washing, enhancing safety and reducing pollution risks. Global perspectives emphasize the importance of protecting ecosystems, with case studies on regions like the Great Barrier Reef and key ports worldwide. The presentation underscores the necessity of collaborative action, regulatory enforcement, and sustainable practices to balance economic growth with environmental stewardship.*

Keywords: *Oil tankers, pollution control, maritime regulations, oil spills*

39. (ID 260) Leadership Dynamics: Navigating Styles and Personality Impact on Ship Crew Management

Author: stud. Isabela-Gabriela BĂDILĂ

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation explores the significance of leadership in maritime settings, focusing on how a leader's personality and actions shape the dynamics and productivity of a ship's crew. It delves into the definition of personality, its role in leadership, and its influence on both the leader and the crew. Different leadership styles, including authoritarian, democratic, and laissez-faire, are analyzed to determine their applicability and effectiveness in various situations. The presentation emphasizes the importance of flexibility in leadership style, advocating for a balanced approach tailored to the diverse challenges of managing a ship's crew. Key qualities of an effective leader, such as vision, empathy, adaptability, and integrity, are highlighted alongside practical approaches to leadership at sea.*

It concludes with insights into how a leader's personality fosters a positive atmosphere, stability, and progress within a team, ensuring efficient collaboration and success.

Keywords: *Leadership styles, personality traits, integrity, crew dynamics*

40. (ID 263) Navigation Application Using Coastal Navigation Methods

Author: stud. Mihaela-Maria BAUER

Scientific Advisor: Prof. Ion CHIORCEA, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This application implements advanced coastal navigation algorithms for maritime position determination utilizing multiple geometric triangulation methodologies. The software integrates vector-based bearing calculations, distance interpolation, and geodetic coordinate transformations to execute traditional navigation techniques, including simultaneous and sequential fixes, horizontal angle measurements, and running fix calculations. The application's architecture implements object-oriented paradigms through hierarchical class structures for navigation entities, algorithmic processing, and interface components. Positional data is computed using haversine formulas for spheroidal surface calculations, with sub-meter precision adjustments for geodetic distortions. The interface renders real-time visualization of position circles, bearing vectors, and transverse capable curves through a cartographic display module. Additional functionality includes position track vectors with temporal waypoint sequencing, navigational data persistence, and HTML-based geospatial export capabilities utilizing JavaScript-based mapping libraries. The system's analytical capabilities enable accurate position determination in complex coastal environments with minimal sightline requirements.*

Keywords: *application, coastal navigation, positional data, measurements, algorithmic processing, position track vectors, position determination*

41. (ID 273) Means and Equipment Used in Search Operations in the Aquatic Environment Both on The Surface and At Various Depths

Author: stud. Denisa-Andreea GHERASIM

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Search operations in aquatic environments represent a crucial component of emergency interventions, with applications in life-saving, object recovery, and the investigation of maritime incidents. These operations rely on a wide range of specialized means and equipment adapted for both surface-level actions and underwater missions at varying depths. Commonly used assets include rapid intervention boats, rescue helicopters, aerial and aquatic drones, as well as remotely operated (ROV) or autonomous underwater vehicles (AUV). Professional divers are equipped with breathing apparatuses, specialized suits, and underwater communication systems. Modern technologies such as side-scan sonar, magnetometers, and GPS systems significantly enhance the accuracy and speed of target localization. This paper provides an overview of these tools and emphasizes the importance of proper equipment and effective coordination for the success of aquatic missions.*

Keywords: *aquatic search, divers, sonar, underwater vehicles, drones, rescue equipment*

42. (ID 279) Hydrodynamic Performance of a Modern Cruise Ship in Calm and Rough Seas

Authors: stud. Andreea-Catalina SINCĂ, stud. Cosmin-Gabriel GHEORGHIU

Scientific Advisor: Assoc. prof. eng. Rita Elena AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project aims to analyze the hydrodynamic performance of the Icon of the Seas cruise ship under varying navigation conditions: calm seas and rough seas. numerical simulations will be carried out on the ship's hull to evaluate parameters such as total resistance, the flow behavior around the hull, and the impact of waves on stability and propulsion efficiency. The results obtained in both scenarios will be compared to analyze*

the effect of sea conditions on energy performance and passenger comfort. The project will highlight the importance of hull geometry and overall design in optimizing fuel consumption and ensuring a stable and efficient journey. The findings will contribute to a better understanding of the hydrodynamic factors involved in the design of modern cruise ships, such as the Icon of the Seas.

Keywords: ship, sea conditions, cruise

43. (ID 282) Study on the Performance Standards of Electronic Charts

Author: stud. Ovidiu-Teodor BOGZA

Scientific Advisor: Prof. assist. Livia RAUCA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Electronic Navigational Charts (ENCs) have significantly increased safety at sea and are now a vital tool in contemporary maritime navigation. This presentation examines the performance standards imposed on these charts and focuses on how they are used within ECDIS (Electronic Chart Display and Information System) frameworks. It discusses the international regulations established by the IMO and IHO, and highlights how crucial they are for preventing maritime accidents. Data accuracy, information updating, and system compatibility are key points addressed in this paper. Additionally, real-life incidents caused by the improper use of electronic navigation systems are presented. The conclusions show that navigational personnel require ongoing training and adaptation to new technological standards, such as S-100.*

Keywords: ENC, ECDIS, performance standards, maritime navigation, maritime safety, IMO, IHO

44. (ID 287) Cyber and Physical Security of Transportation Infrastructure

Authors: stud. Maria-Bianca SCURTU, stud. Theodor-Ionuț SARCU

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *A critical transportation infrastructure integrated with the Internet of Things based wireless sensor network, operates as a cyber-physical system. However, the new form of IoT enabled*

transportation infrastructure is susceptible to cyber-physical attacks in the sensing area, due to inherent cyber vulnerabilities of IoT devices and deficient control barriers that could protect it. Traditional risk assessment processes, consider the physical and cyber space as isolated environments, resulting in IoT enabled transportation infrastructure not being assessed by stakeholders (i.e., operators, civil and security engineers) for cyber-physical attacks. In this paper, a new risk assessment approach for cyber-physical attacks against IoT based wireless sensor network is proposed. The approach relies on the identification and proposal of novel cyber-physical characteristics, in the aspect of threat source (e.g., motives), vulnerability (e.g., lack of authentication mechanisms) and types of physical impacts (e.g., casualties). Cyber-physical risk is computed as a product of the level and importance of these characteristics. Monte Carlo simulations and sensitivity analysis are performed to evaluate the results of an IoT enabled bridge subjected to cyber-physical attack scenarios. The results indicate that 76.6% of simulated cases have high-risk and control barriers operating in physical and cyber space can reduce the cyber-physical risk by 71.8%. Additionally, cyber-physical risk differentiates when the importance of the characteristics that are considered during risk assessment is overlooked. The approach is of interest to stakeholders who attempt to incorporate the cyber domain in risk assessment procedures of their system.

Keywords: *IoT; transportation infrastructure; threat source; vulnerability; physical impact; cyber-physical risk; control barriers; Monte Carlo; sensitivity analysis*

45. (ID 297) Ballast Water in Maritime Transport

Author: stud. Narcis - Madalin GHERGHISAN

Scientific Advisor: LCDR Lecturer Sergiu SERBAN, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Ballast water management in maritime transport is critical for ensuring the stability and safety of vessels while addressing significant environmental concerns. Ballast water is essential for maintaining a ship's draft and operational efficiency; however, it also presents challenges by facilitating the transport of invasive species that can disrupt local ecosystems. This presentation examines*

the ecological and economic impacts of invasive species introduced through ballast water, highlighting specific examples such as zebra mussels in the Great Lakes and Caulerpa algae in the Mediterranean Sea. International regulations, such as the Ballast Water Management Convention established by the International Maritime Organization (IMO), mandate effective ballast water treatment to mitigate these risks. The presentation discusses various treatment technologies, including filtration, UV radiation, and ozonation, emphasizing their roles in environmental protection and safety on board. Ultimately, effective ballast water management is vital for maritime safety and environmental preservation, necessitating regular crew training, investment in advanced technologies, and collaboration with international bodies to enhance management practices and compliance.

Keywords: Ballast Water Management

46. (ID 301) Health and Safety During the Travel of a Cargo Ship

Author: stud. Alex ȘTEFĂNESCU

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In the contemporary era, the imperatives of health and safety have become fundamental priorities across all industries. The maritime sector, however, occupies a distinct position due to the inherent physical risks associated with its operations. At both the national and organisational levels, there is a shared responsibility to establish a secure and sustainable environment for maritime transport, whilst simultaneously minimising hazardous activities that could have a detrimental effect on future generations and the long-term sustainability of our planet. This thesis aims to examine the most prevalent dangers encountered during maritime voyages and to assess the procedures implemented to manage and mitigate these risks. The investigation will also address the potential adverse effects of these hazards on human health, in addition to the environmental consequences of polluting operations, which must be given careful consideration. It is vital to acknowledge the pivotal role of the international shipping industry, which facilitates approximately 90% of global trade and is, therefore, undeniably significant to the global economy. It is therefore vital to develop a more profound*

comprehension of the elements that give rise to these risks and the operational procedures that are in place. This will enhance safety and operational outcomes. The safeguarding of human life and the protection of the environment are considered the principal pillars of this area of study and must be regarded as the guiding principles for all decisions and actions within the industry.

Keywords: Health, Safety, maritime, environment, risks, hazard

47. (ID 302) Safety and Evacuation Systems on Board Cruise Ships

Authors: stud. Andra Antonia NEAGU, stud. Andreea Cătălina SINCA, stud. Andra Antonia NEAGU

Scientific Advisor: Lecturer. eng. George NOVAC, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project explores the safety and evacuation systems implemented on modern cruise ships, focusing on how they protect passengers and crew during emergencies. It analyzes key components such as fire detection, life-saving equipment, evacuation procedures, and the role of technology and crew training. Through real-life case studies, the project highlights the importance of preparedness and continuous improvement in maritime safety.*

Keywords: Maritime safety Evacuation procedures Life-saving equipment

48. (ID 310) Maritime Bottlenecks and Global Trade Vulnerabilities: Analyzing the Ever Given Incident and Historical Straits Blockages

Authors: stud. David-Florin RADU, Vlad-Daniel BOC

Scientific Advisor: Major Superior Instructor Gabriela NICOARĂ, PhD

Institution: "Carol I" National Defence University

Abstract: *This article explores the critical role of maritime chokepoints in global trade and the vulnerabilities exposed by disruptions, with a focus on the 2021 blockage of the Suez Canal by Ever Given, a container ship operated by the Taiwanese shipping company Evergreen Marine. The incident, which halted approximately \$9.6 billion worth of daily trade, underscored the strategic importance of the Suez Canal as a vital artery for*

international commerce. By comparing this event to historical blockages in other key straits, such as the Strait of Malacca and the Strait of Hormuz, the study highlights recurring patterns of economic and logistical disruptions caused by chokepoint vulnerabilities. The article employs a comparative analysis of incident reports, trade flow data, and historical case studies to examine both the immediate and long-term impacts on supply chains, transportation costs, and global economic resilience. Furthermore, it discusses mitigation strategies, including diversifying trade routes and enhancing crisis management systems, to reduce dependency on critical maritime passages. Through this analysis, the research expects to identify key patterns of vulnerability, assess the effectiveness of various risk mitigation approaches, and provide actionable policy recommendations. Ultimately, the study emphasizes the need for robust policies to address risks associated with maritime bottlenecks and safeguard global trade networks against future disruptions.

Keywords: Maritime chokepoints; Suez Canal; Global trade; Supply chain disruption; Economic resilience

49. (ID 311) Implications of The Traffic Separation System on The Saint Lawrence Seaway in Increasing Navigation Safety

Author: stud. Roberto MANOLACHE

Scientific Advisor: Lecturer eng. Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The first chapter provides an overview of the St. Lawrence Seaway, highlighting its geographical, hydrological, and economic characteristics. It analyzes the role of this maritime corridor in international trade, port infrastructure, and its impact on the regional and global economy. The second chapter details international traffic separation regulations and how they apply. It discusses the benefits of this system in reducing collisions and optimizing navigation, as well as its impact on the environment and maritime safety. The third chapter explores the beaconing system used on the St. Lawrence Seaway and their importance in guiding ships. The different types of maritime signaling and their role in preventing accidents and adapting to weather and traffic conditions are presented. The fourth chapter examines the risk factors influencing navigational safety, weather conditions, human error and*

technological risks. It discusses the measures in place to mitigate these risks, such as monitoring systems, safety regulations and incident response strategies. The final chapter is followed by conclusions on the research we have carried out and summarises all the key issues addressed by the study. This analysis highlights the importance of modern regulations and technologies in ensuring safe and efficient maritime traffic on the St. Lawrence Seaway

Keywords: *international traffic, beaconing system, maritime corridor*

50. (ID 315) Emerging Environmental Threats Associated with the Operation of Tankers

Author: stud. Razvan-Mihai GRIGORE

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *There are several types of tankers, including crude oil tankers, product tankers, and LNG carriers. Each type serves distinct purposes in the transportation of liquids across oceans. Crude oil tankers transport unrefined oil, product tankers carry refined petroleum products, while LNG carriers transport liquefied natural gas. Understanding these functions is key to identifying the environmental risks they impose. The exploitation of tankers has led to significant environmental repercussions, such as oil spills, which can devastate marine ecosystems. Additionally, emissions from tanker operations contribute to air pollution and global warming. The ongoing threat of shipping accidents poses risks to biodiversity in marine habitats, highlighting the urgent need for effective regulatory measures. Also, another way to cause damage to marine ecosystem can be letting go of untreated ballast water into the sea. This is why majority of the ships have a ballast water treatment system implemented*

Keywords: *tanker pollution prevention*

51. (ID 318) Naval Equipment: Advancements and Applications

Authors: stud. Fabrizio Madalin HAGIU, stud. Teodora MARINESCU

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Recent advancements in naval equipment have significantly enhanced maritime operations, defense capabilities, and technological integration at sea. Modern naval systems incorporate cutting-edge technologies such as artificial intelligence, autonomous vessels, advanced sonar and radar systems, and next-generation propulsion mechanisms. These innovations have improved detection accuracy, communication efficiency, and operational range for both surface and subsurface platforms. The integration of unmanned systems, including drones and underwater vehicles, allows for enhanced surveillance, reconnaissance, and mine detection with reduced risk to personnel. Furthermore, developments in cybersecurity and electronic warfare equipment ensure better defense against emerging threats in modern naval conflicts. Applications of these advanced systems span military, commercial, and research domains, supporting missions from strategic deterrence to environmental monitoring. As maritime challenges evolve, ongoing innovation in naval equipment remains crucial to maintaining maritime security, ensuring operational superiority, and adapting to the dynamic nature of global naval operations.*

Keywords: *Definition of naval equipment, importance in national defense, types of naval equipment*

52. (ID 319) Electromagnetic Propulsion System for Trains

Authors: stud. Ștefan-Dragoș CERCEL, stud. Paul-Leonard DOGARU, stud. Cosmin-Constantin RUSU

Scientific Advisors: Mihai POPESCU, Ciprian Ion RIZESCU

Institution: National University of Science and Technology Politehnica Bucharest

Abstract: *This is a propulsion system powered by electromagnetic coils for the railway field. The purpose of this paper is to develop a control system for speed and acceleration with possibility of extending research towards magnetic levitation propulsion.*

Keywords: *Electric propulsion, Maglev, Train locomotion*

53. (ID 332) The Legal Framework of Autonomous Ships and the Future of Naval Logistics: Legal and Operational Perspectives

Authors: stud. Dragoș BĂLAN, stud. Ștefan-Andrei GAIȚĂ, stud. Andrei-Cristinel POPA

Scientific Advisor: Prof. Bogdan-Nicolae ȚONEA, PhD

Institution: „A. I. Cuza" Police Academy

Abstract: *This article explores the evolving legal framework governing autonomous ships and assesses their impact on the future of naval logistics from both legal and operational perspectives. The advancement of maritime autonomy raises complex legal questions related to international maritime law, liability, jurisdiction, and the compliance with safety and environmental standards outlined by existing conventions such as SOLAS, UNCLOS, and MARPOL. As autonomous technologies rapidly advance, the need for harmonized international regulation becomes increasingly urgent, requiring clear legal definitions and standardized operational protocols to facilitate global acceptance and integration. Operationally, the transition to autonomous naval logistics promises enhanced efficiency, reduced human error, and increased safety, yet simultaneously introduces novel risks including cybersecurity vulnerabilities and uncertainty in crisis response protocols. By analyzing existing regulatory frameworks and operational scenarios, this paper identifies critical legal gaps and proposes recommendations for policymakers and maritime stakeholders. It also highlights the necessity of international cooperation in developing uniform regulatory standards and addressing the ethical, environmental, and technological challenges posed by autonomous maritime vessels. The conclusions underline the importance of proactive legislative measures and strategic adaptation by the maritime sector to successfully integrate autonomous ships, thereby ensuring sustainability, operational efficiency, and legal clarity within the global maritime industry.*

Keywords: *autonomous ships, artificial intelligence, navigation, jurisdiction*

54. (ID 339) The Journey of Autonomous Ship Technology

Authors: stud. Andrei-Valentin GURGU, stud. Ediz IUSMEN

Scientific Advisor: Lecturer Eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation explores the evolution and impact of autonomous ship technology in the maritime industry. It outlines the levels of autonomy, key technologies, historical milestones, benefits, challenges, and regulatory and ethical considerations. The document concludes that continued innovation and global collaboration are vital for the safe and sustainable adoption of autonomous vessels.*

Keywords: *Autonomous ships, Maritime technology, Maritime innovation, Maritime regulation*

55. (ID 343) Firefighting Equipment on an Oil Tanker

Authors: stud. Elvir-Denis GANI, stud. Sebastian IONESCU-IONICA

Scientific Advisor: Lecturer Eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This conference paper examines firefighting equipment on oil tankers, focusing on recent innovations and safety improvements. It compares modern systems like water mist and inert gas with traditional CO₂-based methods. A case study of TI Europe demonstrates onboard applications, while the MT New Diamond incident highlights real-world challenges. The study also compares firefighting approaches across vessel types, concluding that both advanced technology and proper crew training are vital for fire safety at sea.*

Keywords: *Firefighting Equipment*

56. (ID 344) Study on the Impact of the Automatic Identification System on Collision Avoidance and the Need for Officers' Training Onboard

Author: stud. Alexandra BAJENARU

Scientific Advisor: LCDR Lecturer eng. Sergiu ȘERBAN, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In the era of technology and digitalization, the Automatic Identification System (AIS) has become a vital component of maritime navigation. Its primary role is to provide accurate, real-time information regarding the position and movement of vessels, thereby enhancing the safety and efficiency of maritime transport.*

Keywords: *AIS, safety, collision, communication, officer*

57. (ID 353) Design and Operation of The Anchoring Installation for an 18,000 Teu Container Ship

Authors: stud. Mădălina Valentina TUDOSE, stud. Camelia Bianca ȘTEFAN, stud. Mădălin Andrei SURUIANU

Scientific Advisor: Lecturer Eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper addresses the design and operational considerations of the anchoring system for a large containership with a capacity of 18,000 TEU. Given the substantial dimensions and mass of such vessels, the anchoring system must meet stringent technical and safety requirements to ensure secure mooring under diverse environmental conditions. The study examines the engineering principles behind anchor selection, chain configuration, and equipment sizing, aligned with international maritime regulations and classification society standards. Additionally, the research analyzes operational procedures for anchoring, including deployment, holding power assessment, and retrieval, with a focus on mitigating risks during heavy weather or congested anchorage areas. Case studies and simulations are used to illustrate best practices and to evaluate system performance. The findings emphasize the critical role of robust anchoring systems in the overall safety and maneuverability of ultra-large container vessels.*

Keywords: *Anchoring system, containership, 18,000 TEU, ship design, maritime engineering, mooring operations, anchoring equipment, safety at sea, ship handling, classification standards*

58. (ID 354) Safe and Economical Navigation Between Two Ports of Your Choice (Amsterdam-Singapore)

Author: stud. Ioan Radu STAN

Scientific Advisor: Captain Assoc. prof. eng. Sergiu LUPU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper analyzes the navigation between the ports of Amsterdam and Singapore from both security and economic perspectives. The study investigates the major maritime routes, risk factors, and strategic chokepoints that influence navigational security along this intercontinental corridor. Particular attention is given to piracy threats, geopolitical tensions, and environmental risks that may affect vessel safety. From an economic standpoint, the research evaluates the cost-efficiency of different routing options, taking into account fuel consumption, canal transit fees, operational costs, and potential delays. The integration of security strategies with cost optimization models is explored to propose best practices for safe and economically viable voyages. The findings highlight the complex balance between ensuring navigational safety and*

maintaining competitive operating costs in global shipping between Europe and Asia.

Keywords: *Maritime navigation, security risks, economic efficiency, Amsterdam, Singapore, shipping routes, maritime safety, cost optimization, piracy, global trade*

59. (ID 355) Case Study on The Gulf of Mexico and How Waves and Tides Affect Port Activities

Author: stud. Lavinia Maria ROIU

Scientific Advisor: Liutenant lecturer eng. Andra NEDELCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This case study examines the influence of wave dynamics and tidal variations on port operations within the Gulf of Mexico. The Gulf's unique hydrographic and meteorological characteristics significantly affect the safety, efficiency, and scheduling of maritime activities. Through the analysis of historical data and observational studies, the research identifies how wave height, tidal range, and storm surges impact vessel maneuvering, berthing procedures, cargo handling, and overall port logistics. Special attention is given to extreme weather events such as hurricanes and their amplified effects on tidal behavior and port infrastructure. The findings underline the necessity for adaptive port management strategies, including improved forecasting systems, resilient infrastructure design, and dynamic scheduling models to mitigate operational disruptions. This study contributes valuable insights into optimizing port performance in regions exposed to complex marine conditions.*

Keywords: *Gulf of Mexico, port operations, waves, tides, maritime logistics, vessel maneuvering, storm surges, port infrastructure, maritime safety, coastal management*

60. (ID 356) Study on the Fire Extinguishing Intervention Following an Explosion at An Exploitation Platform Located in The Exclusive Economic Zone of Romania

Author: stud. Iulian STANGA, stud. Constantin TUDOSE

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Hydrocarbons are one of the essential components of the global economy and modern society, and extraction processes*

involve the use of complex equipment of very large sizes and which are constantly subject to operational safety risks. These energy sources provide indispensable fuels and basic raw materials for many industrial sectors, being a key element for maintaining the sustainability and development of current economies. Their significance comes from a combination of interdependent factors and is reflected in various dimensions of economic, social and technological progress. As a result, equipment intended for interventions in potentially hazardous situations (fires, explosions) must be constantly operational and easy for the personnel operating offshore drilling facilities.

Keywords: *Offshore platform, explosion, firefighting intervention, emergency response, Romania, Exclusive Economic Zone, Black Sea, maritime safety, risk management, oil and gas industry*

61. (ID 357) Management and Leadership on Board the Ship

Authors: stud. Ștefan-Nicolae TALPEȘ, stud. Darius PANICAN

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study examined the differences between management and leadership and situations in which we can improve leaders through actions related to their role. Management and leadership are distinct but essential criteria for success on board a ship. Management focuses on organizing and coordinating resources to achieve specific objectives effectively. While managers ensure stability and coherence through systems and processes, leaders stimulate innovation and change by influencing people. Ultimately, the synergy between management and leadership fosters sustainable growth and long-term success.*

Keywords: *crew motivation, on-board organization, teamwork, naval management, onboard communication*

62. (ID 359) Personal Life Saving Appliances

Author: stud. Ștefan-Nicolae TALPEȘ

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Personal life-saving appliances are essential safety devices designed to protect individuals during emergency situations, particularly in marine, aviation, and disaster scenarios. Their*

effectiveness lies in enhancing buoyancy, visibility, and communication, often incorporating advanced materials and technologies. Proper training and maintenance are crucial for optimal performance during emergencies. As safety awareness grows, the development of more user-friendly and efficient life-saving appliances continues to advance.

Keywords: *Life-saving appliances, Personal safety equipment, Emergency equipment, Rescue gear, Consequences*

63. (ID 362) Herald of Free Enterprise Disaster: Incident Analysis

Authors: stud. Alexandra-Maria LAZU, stud. Antonia Ramona MÎȘU

Scientific Advisor: Lecturer eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The Herald of Free Enterprise disaster was caused by human errors, systemic oversights, and design flaws, leading to the tragic loss of 193 lives when the ferry capsized with its bow doors open. This conference paper presents, the maritime industry implemented regulatory reforms, advanced safety technologies, and cultural changes to prevent similar tragedies in the future.*

64. (ID 369) Decentralizing Maritime Security: Blockchain Technology as a Paradigm Shift in Anti-Piracy and Port Operations

Author: stud. Darius-Vasile MICULA

Institution: „Alexandru Ioan Cuza” Police Academy, Bucharest

Abstract: *Blockchain technology has the capacity to enhance maritime and naval security through decentralized, transparent, and attacking proof solutions. This study examines practical blockchain technology applications in vessel tracking, maritime document verification, and smart contract-based supply chain management. The analysis highlights key operational benefits including reduced fraud, improved piracy prevention, and streamlined port operations. Implementation challenges are also addressed, particularly regulatory barriers, interoperability issues with legacy systems, and infrastructure investment requirements. Reviewing case studies from Singapore's digital shipping corridors and EU maritime safety*

initiatives, the paper states blockchain's effectiveness in combating document forgery and unauthorized vessel activities. The article emphasises the critical need for international standards and public-private partnerships to facilitate widespread adoption. The research contributes to ongoing discussions about technological modernization in maritime security by proposing a framework for balanced implementation that considers both technological capabilities and regulatory realities.

Keywords: *blockchain, maritime security, naval legal operations, smart contracts, anti-fraud systems*

65. (ID 371) Methods and Techniques for Assessing Pollution Risks in Oil Tanker Operations

Author: stud. Carlos IVAŞCU

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This research examines human reliability in oil tanker operations in the context of loading, discharging, and bunkering operations to avert oil spills. Loading pumps oil from shore to cargo tanks, discharging transfers oil ashore, and bunkering is fueling the vessel, all of which are high-risk and error-prone operations. Historical spillage data for the period 1970–2008 identify human errors as one of the principal factors of environmental harm. The study strengthens Human Reliability Analysis (HRA) by incorporating the synthesis of Human Organizational Factors (HOF), such as crew training, safety policies, and organizational management, into the Formal Safety Assessment (FSA) framework. Further, it also strengthens the Cognitive Reliability and Error Analysis Method (CREAM) for its implementation in maritime contexts, resulting in a novel framework that can identify, quantify, and reduce human errors. This study provides risk mitigation measures based on case studies of tanker operations, such as improved procedures for inert gas valve management during discharge. The main aim is to reduce incidents caused by human error, improve operational safety, and minimize environmental harm, hence strengthening maritime safety standards.*

Keywords: *Human Reliability Analysis (HRA), Formal Safety Assessment (FSA), Maritime Safety, Loading and Discharging Operations, Environmental Protection*

66. (ID 373) A Computational Study of Ship Performance in Pack Ice and Water Conditions

Author: stud. Alexandru FÎNTÎNĂ

Scientific Advisor: Assoc. prof. eng. Rita Elena AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study presents the results from literature on simulation of the interaction between a ship, pack ice, and surrounding water. The model integrates ship hydrodynamics, ice mechanics, and fluid-structure interactions to simulate ice resistance, motion, and force distribution. Results show that both the mechanical properties of ice and the influence of water significantly affect the ship's resistance and maneuverability. The simulation provides a cost-effective and safe method for evaluating ship behavior in polar conditions, offering valuable insights for ice-class vessel design and route planning. The findings highlight the importance of accurate modeling for improving operational safety and efficiency in ice navigation.*

Keywords: *Pack ice, surrounding water, hydrodynamics, ice mechanics, fluid-structure, resistance, polar conditions, route planning*

67. (ID 387) Navigation in the Baltic Sea: Routes, Depths and Pilotage Regulations

Author: stud. Omer OZGEAN

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The Baltic Sea presents unique navigational challenges due to its geography, variable depths, and dense maritime traffic. This paper examines the main characteristics that influence safe and efficient navigation in this region, with a focus on established maritime routes, hydrographic limitations, and national pilotage requirements.*

Keywords: *Navigation, Traffic, Routes*

68. (ID 391) Beyond the Sails: Peter Worsley's Wind Innovations

Author: stud. Mihai-Marian GHIOCEL

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation highlights Peter Worsley's innovative contributions to the field of marine wind propulsion, focusing on the exploration of the rotary sail concept and its potential applications. The presentation explores the challenges and advancements in wind and solar technologies, including the EnergySail hybrid system, and underscores the continued importance of innovation in creating a cleaner and more efficient future for maritime transport.*

69. (ID 398) Study on the Organization and Management of Firefighting Operations on Board a 150,000 DWT Oil Tanker

Authors: stud. Diana Iuliana CIOBANU, stud. Andrei APOSTOL

Scientific Advisor: Lecturer Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The present work explores the organization and management of firefighting operations aboard a 150,000 DWT oil tanker, emphasizing the critical need for efficient response mechanisms in the high-risk environment of maritime hydrocarbon transport. It examines the structural and operational aspects of emergency preparedness, including the coordination of intervention teams, the allocation of crew responsibilities, and the utilization of specialized firefighting equipment. Key ignition sources are identified, alongside preventive measures and control strategies integrated into the ship's safety management system. The study also highlights the importance of continuous training and drills to ensure crew readiness and swift response. By addressing both preventive and reactive components, this analysis underlines the essential role of structured management in safeguarding life, the environment, and maritime assets during fire-related emergencies.*

Keywords: fire, tanker, safety, crew, emergency

70. (ID 402) Study on Modern Technologies and Their Impact in the Naval Field

Author: stud. Gabriel ION

Scientific Advisor: Lecturer Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Modern technologies are rapidly changing the naval field, influencing everything from ship design. This study examines these technologies, focusing on their impact on naval capabilities and operations. It covers areas such as autonomous systems, artificial intelligence, cybersecurity, and advanced materials. The study analyzes how these technologies are reshaping naval warfare, enhancing efficiency, and improving the safety of naval personnel. It also explores the challenges and ethical considerations associated with these advancements, providing insights into the future of naval technology and its implications for global security.*

Keywords: *Study on Modern Technologies and Their Impact in the Naval Field.*

71. (ID 403) Analysis of Incident Factors on Oil Tankers and Preventive Measures

Authors: stud. Cosmina Ionela CHIRICU, stud. Diana Georgiana STOIAN

Scientific Advisor: Lecturer eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Oil tanker safety hinges on reducing human error, ensuring structural integrity, and enforcing rigorous safety protocols. Key measures include adopting double hull designs, adhering to the ISM Code, and conducting regular maintenance to prevent accidents and environmental harm.*

Keywords: *Oil tanker, Accidents, Safety, Double hull*

72. (ID 406) Distress Signals: History, Situations, Use

Author: stud. Andrei APOSTOL

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project offers an overview of how ships send out distress signals and the systems developed to support maritime safety. It reflects on the historical need for reliable communication at sea and follows the progress from early distress calls to today's advanced technologies. The presentation aims to show how these systems have become essential in responding to emergencies, preventing disasters, and protecting lives on the water.*

73. (ID 411) Lifesaving Equipment on Ships

Authors: stud. Antonia-Ramona MISU, stud. Alexandra-Maria LAZU

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation highlights the essential lifesaving equipment used on ships to ensure safety during maritime emergencies. It covers key tools such as lifeboats, life rafts, life jackets, immersion suits, life buoys, distress signals, rescue boats, and davits. The importance of regular emergency drills and proper maintenance is also emphasized. Together, these elements play a critical role in protecting lives at sea and ensuring effective response in crisis situations.*

Keywords: *Lifesaving equipment, Maritime safety, Lifeboats, Life rafts, Life jackets, Immersion suits, Life buoys, Distress signals, Flares*

74. (ID 412) Application of the ISM Code in Commercial Navigation - The Role of the Safety Management System in Preventing Maritime Accidents

Author: stud. Andrei APOSTOL

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project explores the application of the International Safety Management (ISM) Code in commercial navigation, with a focus on how the Safety Management System (SMS) contributes to the prevention of maritime accidents. It highlights the importance of standardized procedures, crew training, and risk management in promoting a strong safety culture onboard. Through practical examples and analysis, the project aims to show how proper implementation of the ISM Code helps improve operational safety and environmental protection across the shipping industry.*

75. (ID 413) Procedures for Container Checks Before and During the Maneuver

Author: stud. Alexandra-Maria JIANU

Scientific Advisor: LCDR eng. Dragoș SIMION

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The thesis covers procedures for container inspection and cargo handling in maritime transport. It presents theoretical aspects related to ship stability, loading, and the transport of goods, including dangerous cargo. One chapter is dedicated to a practical case of securing oversized cargo, and the final section includes a loading simulation using the MACS3 program.*

Keywords: *Procedures, containers, cargo, transport*

76. (ID 415) Marine Accidents Caused by Improper Cargo Distribution and Mishandling

Authors: stud. Faruk-Damian BUSEGEANU, stud. Cosmin Gabriel GHEORGHIU

Scientific Advisor: Lecturer eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Improper cargo distribution and mishandling are major causes of marine accidents. This presentation highlights key risk factors. Preventive measures including better training and strict adherence to safety protocols are essential to reduce these risks and ensure safe maritime operations.*

Keywords: *ship cargo distribution, marine accidents, maritime safety*

77. (ID 417) Leadership and Assertiveness

Author: stud. Andreea Diana CROITOR

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Assertiveness is a critical leadership trait, particularly in high-stakes environments such as maritime command. This paper explores the role of assertiveness in enhancing leadership effectiveness on board, emphasizing the balance between authority and approachability in an assertive commander. Through assertive communication, commanders foster clear decision-making, reduce ambiguity, and strengthen the cohesion and morale of the crew. The study highlights how assertive leadership improves safety, operational efficiency, and mutual respect, thereby promoting a culture of responsibility and trust among crew members. Assertiveness, when applied appropriately, serves as a cornerstone for effective leadership, contributing to a resilient and cooperative onboard environment.*

Keywords: *Leadership, assertive communication, assertive commander, mutual respect, onboard environment*

78. (ID 425) The Modernization of the IAR 330 Platform for Naval Missions

Authors: stud. Andrei-Sebastian PANAIT, stud. Iordana-Nicoleta VANCEA, stud. Alex-Marian UȚĂ

Scientific Advisor: Lt.Col. eng. Cornel ARAMĂ, PhD

Institution: "Henri Coandă" Air Forces Academy

Abstract: *The IAR 330 Puma Naval is a Romanian naval helicopter designed for maritime operations. It is a specialized variant of the IAR 330, which itself is a licensed version of the Aérospatiale SA 330 Puma, produced by IAR Braşov. This helicopter has been adapted to meet the operational needs of the Romanian Navy, primarily for search and rescue (SAR), anti-submarine warfare (ASW), and maritime surveillance. It can also transport personnel and supplies to and from naval ships, especially frigates like the Regele Ferdinand-class, from which it can take off and land. These capabilities make it a strategic asset for defending Romania's maritime interests and supporting NATO operations in the Black Sea region.*

Keywords: *helicopter, search, rescue, transport, capabilities, supplies*

79. (ID 434) Emotional Intelligence Onboard Ships: A Key Factor in Leadership and Crew Psychological Well-being

Author: stud. Andrada-Cristiana CUCORANU

Scientific Advisor: Captain Assoc. prof. eng. Sergiu LUPU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This study explores the role of emotional intelligence onboard ships, not as a soft skill, but as a foundational force in effective leadership and psychological resilience at sea. In the high-pressure, often isolating world of maritime life, the ability to understand, regulate, and respond to emotions becomes more than just helpful, it becomes essential. Through a lens that blends psychology with seafaring reality, this research examines how emotional intelligence directly influences leadership dynamics, interpersonal relationships, and the emotional climate of a crew. Special attention is given to the impact of empathy, emotional*

regulation, and self-awareness in navigating both crisis and routine. Ultimately, this paper argues that emotionally intelligent officers are not just better leaders, they are safer, more compassionate and more capable of sustaining the well-being of their teams across long voyages. In an industry built on precision and control, this study makes space for the human heart.

Keywords: Emotional intelligence, leadership, crew well-being, psychological, empathy, regulation, mental health, self-awareness

80. (ID 435) Perception and Maneuvering System for Unmanned Surface Vehicles

Author: stud. Bianca MIȘCOV

Scientific Advisor: Lt.jg eng. Nicolae-Silviu POPA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper presents the development of an autonomous perception and maneuvering system for USVs (Unmanned Surface Vehicles), using ultrasonic sensors for obstacle detection and safe navigation on water. The system is designed to collect and process data in real time, allowing the vehicle to adaptively respond to changes in its surroundings. The control algorithm uses sensor input to generate an optimal trajectory, ensuring autonomous movement without collisions. The proposed platform stands out through its simplicity, energy efficiency, and adaptability to various practical applications, such as environmental monitoring, technical inspections, or exploration missions in hard-to-reach areas. The results obtained highlight the viability of the solution and its potential for further development into more complex autonomous systems.*

Keywords: USV, autonomous navigation, ultrasonic sensors, obstacle avoidance, surface robotics, path planning

81. (ID 445) Regional vs. Global: A Comparative Analysis of Málaga and Antwerp Ports

Authors: stud. Denisa-Geanina DEACU, stud. Adriana-Maria GHEORGHIȘOR

Scientific Advisor: Lecturer Corina SANDIUC, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation examines the contrasting roles of the Port of Málaga and the Port of Antwerp in global trade, highlighting their scale, infrastructure, and economic impacts. The Port of Málaga, a smaller, tourism-oriented port, primarily focuses on Mediterranean trade, cruise tourism, and agricultural exports. Despite its importance to the region, it operates on a smaller scale compared to larger global trade hubs. In contrast, the Port of Antwerp is a major European industrial and logistics hub, renowned for its advanced infrastructure, extensive petrochemical industry, and its significant role in international trade. This comparison underscores the diverse functions of ports within the global maritime system, from regional trade to large-scale industrial operations, and highlights the varying levels of influence that different ports exert on international commerce.*

Keywords: *Port of Málaga, Port of Antwerp, global trade, regional trade, economic impact*

82. (ID 448) Study on Multimodal Transport in Maritime and Inland Waterway Transport

Author: stud. Can Fikiret ALI

Scientific Advisor: Captain Assoc. prof. eng. Sergiu LUPU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Multimodal transport represents an efficient and sustainable solution for optimizing logistics chains through the combined use of multiple transport modes, such as road, rail, maritime, and inland waterway. This paper analyzes the role of maritime and inland waterway transport within the multimodal system, highlighting the economic and environmental advantages, as well as the challenges related to infrastructure, interoperability, and regulations. The aim is to highlight the impact of these transport modes on international trade and intermodal connections in key regions. The study provides an overview of current trends and opportunities for sustainable development in the transport sector.*

Keywords: *multimodal transport, maritime transport, inland waterway transport, logistics, sustainability, infrastructure, international trade*

83. (ID 451) Analysis of the Integration of Multimodal Transport into Maritime and Inland Waterway Port Infrastructure

Author: stud. Can Fikiret ALI

Scientific Advisor: Captain Assoc. prof. eng. Sergiu LUPU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study examines the integration of multimodal transport into maritime and inland waterway port infrastructure, focusing on enhancing logistics efficiency and sustainability. It highlights the role of combining maritime, inland waterway, rail, and road transport to improve connectivity and facilitate international trade. The paper addresses key challenges, including infrastructure modernization, regulatory alignment, and technological integration. It also emphasizes the economic and environmental benefits of multimodal transport, particularly in reducing costs and carbon emissions. The study concludes with recommendations for overcoming infrastructure limitations and fostering collaboration among stakeholders to support sustainable development in port operations.*

Keywords: *multimodal transport, maritime port infrastructure, inland waterway transport, intermodal connections, logistics optimization, sustainability, international trade, port development, infrastructure challenges, environmental benefits*

84. (ID 452) Evaluation of Cargo Space Lost When Using Alternative Fuels. Case Study of a Container Ship

Author: stud. Mihnea-Nicușor PLEȘU

Scientific Advisor: Prof. assist. Livia RAUCA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The transition towards alternative fuels in maritime transport, driven by environmental regulations and sustainability goals, introduces new technical and operational challenges. One such challenge is the reduction of available cargo space due to the increased volume or specific storage requirements of alternative fuel systems. This study evaluates the loss of cargo space resulting from the implementation of alternative fuel technologies on a container vessel. By analyzing a case study of a specific containership, the research quantifies the impact of different fuel types such as LNG, methanol, or hydrogen on cargo capacity and operational efficiency.*

The findings aim to support shipowners and naval architects in making informed decisions during the design or retrofitting of vessels for greener propulsion solutions.

Keywords: *alternative fuels, cargo space loss, containership, maritime transport, LNG, hydrogen, methanol, vessel design, fuel storage systems, green shipping*

85. (ID 457) Study on the Impact of Oil Pollution on the Marine Environment

Author: stud. Cosmin DINCĂ

Scientific Advisor: LCDR Instr. sup. eng. Andrei POCORA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study examines the impact of oil pollution on the marine environment, with a focus on the ecological consequences of oil spills. The presence of petroleum substances in the water leads to contamination of marine ecosystems, affecting both flora and fauna. Key areas of concern include the disruption of food chains, damage to coastal habitats, and long-term effects on biodiversity. The research also addresses the persistence of oil in marine sediments and its toxic impact on various marine species. Emphasis is placed on the importance of preventive measures, spill response strategies, and environmental regulations to reduce the risk and severity of such pollution events.*

Keywords: *Oil pollution, marine ecosystem, biodiversity, contamination, oil spills.*

86. (ID 459) The Impact of Port Infrastructure on the Efficiency of Containerized Transport Operations

Author: stud. Bogdan ALBULESCU

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores the relationship between port infrastructure and the efficiency of containerized transport operations. Efficient port infrastructure including modern terminals, intermodal connections, and advanced handling equipment plays a critical role in reducing vessel turnaround times, minimizing delays, and optimizing cargo flow. The research highlights how investments in infrastructure contribute to improved logistics performance and*

support the growing demand for containerized shipping. By analyzing key components such as berth availability, crane productivity, and hinterland connectivity, the study emphasizes the need for continuous development and strategic planning in port facilities. Ultimately, enhancing infrastructure is shown to be a fundamental driver for operational efficiency and global trade competitiveness in the container transport sector.

Keywords: *Port infrastructure, containerized transport, operational efficiency, logistics, terminal*

87. (ID 460) The role of Artificial Intelligence in Maritime Navigation: From Route Planning to Accident Prevention

Author: stud. Cosmin DOROFTEI

Scientific Advisor: LCDR Instr. sup. eng. Andrei POCORA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study investigates the role of artificial intelligence (AI) in enhancing maritime navigation, from route planning to accident prevention. AI technologies such as machine learning, computer vision, and predictive analytics are increasingly integrated into ship systems to optimize voyage planning, assess navigational risks, and support real-time decision-making. The research highlights how AI contributes to fuel efficiency, reduced transit times, and enhanced safety by analyzing vast amounts of data, including weather patterns, traffic density, and vessel behavior. Special attention is given to collision avoidance systems and autonomous navigation tools that reduce human error. The findings underline the transformative potential of AI in creating a more efficient, sustainable, and secure maritime transport environment.*

Keywords: *Artificial intelligence, maritime navigation, route planning, accident prevention, smart shipping.*

88. (ID 461) Autonomous Ships - Planning and Carrying Out Voyages Without a Crew on Board

Author: stud. Alexandru ALDEA

Scientific Advisor: LCDR Instr. sup. eng. Andrei POCORA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores the development and operational principles of autonomous ships, focusing on their ability to plan and*

execute voyages without a crew on board. Integrating advanced technologies such as artificial intelligence, sensor fusion, and automated control systems, these vessels are designed to navigate safely and efficiently with minimal human intervention. The research examines key components including real-time data processing, route optimization, and remote monitoring. Benefits such as enhanced safety, reduced operational costs, and lower environmental impact are highlighted, alongside challenges related to regulatory frameworks, cybersecurity, and technological reliability. The study provides insight into the future of unmanned maritime transport and its potential to revolutionize the global shipping industry.

Keywords: Autonomous ships, unmanned vessels, voyage planning, maritime automation, navigation systems.

89. (ID 471) The Art of Sailing

Authors: stud. Anissia-Nicole MANGU, stud. Cristian-Robert HOLBAN

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Sailing is both a science and an art, blending natural forces with human skill. This comprehensive overview explores the fundamentals of sailing, beginning with how sailboats harness wind power through aerodynamics and navigate the ever-changing dynamics of waves. Mastery of boat handling such as sail trim, steering, tacking, and gybing is essential for optimizing performance. Navigation plays a critical role, requiring the ability to read nautical charts, utilize GPS, and monitor weather forecasts for safe passage. Safety is a cornerstone of sailing, supported by essential equipment, established emergency protocols, and swift response strategies. For those drawn to competition, racing introduces tactics like wind shift anticipation and strategic maneuvers to outpace rivals. Recreational sailors enjoy the joys of cruising, coastal exploration, anchoring, and water-based leisure activities. Maintaining and repairing vessels is vital for longevity and safety, involving regular checks and hands-on repair skills. Finally, the guide emphasizes environmental stewardship through sustainable practices, reduced waste, and conscious water use ensuring that the art of sailing thrives in harmony with nature.*

90. (ID 474) The Power of AI In Navigation and Transport

Author: stud. Belmondo-Ionuț FORȚOFOI

Institution: „Alexandru Ioan Cuza" Police Academy

Abstract: *Both navigation and maritime transport play a very important role not only in the global economy but also in the smooth functioning of today's world. At the same time, traditional maritime operations face many challenges, such as frequent human errors, fuel insufficiency an essential resource for nearly every ship and serious threats to the environment. The introduction of Artificial Intelligence into this well-known maritime sector is meant to transform the way ships usually navigate, operate, and communicate with one another. AI aims to improve safety through autonomous ships, to clearly optimize routes, and to monitor maintenance systems in real time. More developed countries and companies already use AI-based technologies. As the maritime industry continues to evolve, AI emerges as a powerful tool that undeniably helps both navigation and maritime transport. The use of AI in this field contributes to building a safer and more sustainable future for the entire navigation and transport system.*

Keywords: *Power, Artificial Intelligence, maritime, powerful tool, sustainable future.*

91. (ID 486) The Dynamics of Shipwrecks: Environmental, Structural, and Historical Perspectives

Authors: stud. Alessandro TOMA-LAVRIC, stud. Andrei VELICĂ

Scientific Advisor: Lecturer eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This conference paper explores the dynamics of shipwrecks from environmental, structural, and historical perspectives. It examines how natural forces, ship design, and human factors contribute to maritime disasters. By integrating these elements, the study offers insight into the causes and impacts of shipwrecks, highlighting their relevance to marine archaeology, environmental science, and naval engineering.*

Keywords: *ship disasters, shipwrecks, historical*

92. (ID 494) Sustainable Maritime Transport: Strategies for Reducing Naval Carbon Emissions

Author: stud. Darian GROZA

Scientific Advisor: Bogdan Nicolae TONEA

Institution: Academia de Politie Alexandru Ioan Cuza

Abstract: *This article examines sustainable strategies aimed at significantly reducing carbon emissions within the maritime transport sector, a critical contributor to global greenhouse gas emissions. Given the increased international emphasis on sustainability, notably through agreements such as the IMO's Initial Greenhouse Gas Strategy and the Paris Agreement, maritime stakeholders face mounting pressure to transition towards more environmentally friendly operations. This study identifies and evaluates key strategic pathways including technological innovation, alternative fuels such as liquefied natural gas (LNG), biofuels, hydrogen, ammonia, electrification, and operational improvements such as voyage optimization and slow steaming. The analysis further explores regulatory frameworks and policy incentives designed to encourage industry-wide adoption of sustainable practices. Special attention is given to the role of international cooperation and public-private partnerships in facilitating the necessary infrastructure investments and technological advancements. By critically assessing current initiatives and emerging solutions, the article highlights best practices and provides actionable recommendations for ship operators, port authorities, policymakers, and researchers. Ultimately, the paper argues that a holistic approach combining technological advancement, stringent regulation, economic incentives, and international collaboration is essential for achieving significant emission reductions. The conclusions emphasize the urgency of comprehensive and integrated strategies to ensure the maritime sector aligns effectively with global climate goals and contributes meaningfully towards environmental sustainability.*

93. (ID 114) The Study on The Sar (Search and Rescue) System in Denmark

Author: stud. Robert-Marian Marga

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: Denmark has fully adopted and implemented the International Convention on Maritime Search and Rescue (SAR), aligning its national legislation and operational systems with the standards set by the International Maritime Organization (IMO). The country maintains a highly efficient SAR structure, coordinated by the Joint Rescue Coordination Centre (JRCC Denmark) in collaboration with the Danish Maritime Authority, the Coast Guard, and the Royal Navy. These entities work together to ensure swift responses to maritime emergencies. Denmark uses advanced technologies such as radar, satellite communications, drones, and thermal imaging to enhance operational effectiveness. Regular SAR exercises with neighboring countries strengthen regional cooperation and improve response capabilities. Additionally, Denmark contributes to global maritime safety through international partnerships and support for developing SAR capacities in other nations.

Keywords: SAR (search and rescue), Denmark, International Maritime Organization (IMO), Joint Rescue Coordination Centre (JRCC Denmark)

94. (ID 119) Study on Carbon Emissions in Maritime Transport

Authors: stud. Ștefan-Paul CURCA, stud. Emir MOLOGEAN

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: This study investigates carbon emissions in maritime transport, a critical sector for global trade that significantly contributes to global warming and climate change. Maritime transport accounts for approximately 2-3% of global CO₂ emissions, primarily due to the use of fossil fuels and the combustion processes in large marine engines. The study identifies the primary sources of emissions, such as heavy fuel oil and diesel-powered engines, and assesses their environmental and public health impacts. Additionally, the research explores international regulations, particularly the measures adopted by the International Maritime Organization (IMO) to reduce greenhouse gas emissions from the shipping industry. Various alternative technologies and solutions are examined, including the adoption of cleaner fuels, renewable energy sources, and innovations like route optimization and fuel efficiency

improvements. Finally, the study offers recommendations for reducing carbon emissions in maritime transport, emphasizing the need for stricter regulatory frameworks, investment in sustainable technologies, and enhanced international cooperation to achieve global climate goals.

Keywords: *carbon emissions, alternative technologies, solutions*

95. (ID 120) Innovative Technological Solutions Regarding the Transformation of Maritime Transport, Autonomous Ships and the Reduction of Fuel Consumption

Authors: stud. Emir MOLOGEAN, stud. stud. Ștefan-Paul CURCA

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores innovative technological solutions transforming the maritime transport sector, focusing on the development of autonomous ships and technologies aimed at reducing fuel consumption. With increasing demands for energy efficiency and pressure to lower carbon emissions, the maritime industry is undergoing significant changes. Autonomous vessels, powered by advanced navigation systems, artificial intelligence, and satellite communications, are set to revolutionize shipping by enhancing route management, reducing human errors, and improving safety. Simultaneously, fuel consumption optimization technologies, including improved ship designs, the use of alternative fuels, and hybrid or electric propulsion systems, are playing a pivotal role in minimizing the environmental impact of maritime transport. The study highlights the benefits of these technological innovations, the challenges involved in their implementation, and their potential impact on the future of the industry. It also emphasizes the need for a coherent global regulatory framework to support the adoption of these sustainable solutions, ensuring a greener and more efficient maritime transport system.*

Keywords: *Innovative technological, autonomous ships, reduction of fuel consumption*

96. (ID 123) Ship Detection Through (AIS) and Radar Systems

Authors: stud. Alexandru MIRICA, stud. Teodor MELINTIOI

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores the use of ship detection through Automated Identification Systems (AIS) and radar systems, which are fundamental to ensuring maritime safety and efficient navigation. AIS allows vessels to transmit and receive real-time information about their location, speed, and direction, enhancing situational awareness and enabling the prevention of collisions. AIS is widely used for tracking and managing maritime traffic, providing accurate and up-to-date data. On the other hand, radar systems play a crucial role in detecting objects around the ship, even under challenging weather conditions such as fog or at night when visual visibility is limited. Radar systems can detect objects at long distances and are vital for avoiding collisions, especially in congested areas or near coastal zones. This study analyzes the advantages and limitations of each system, as well as how the integration of AIS and radar enhances maritime safety and traffic management. Additionally, the challenges related to system interoperability and international regulations governing the use of these technologies are discussed.*

Keywords: *detection systems, radar systems*

97. (ID 124) Global Navigation Satellite Systems (GNSS)

Authors: stud. Miha-Romica-Ștefan BIBICU, stud. Alexandru LAZĂR

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study examines the use of Global Navigation Satellite Systems (GNSS) in maritime navigation, highlighting their crucial role in enhancing the accuracy and safety of navigation. GNSS, which includes satellite networks such as GPS, GLONASS, Galileo, and BeiDou, provides precise information about a vessel's position, speed, and direction, enabling real-time navigation on any maritime route. These systems have revolutionized maritime navigation by eliminating reliance on traditional orientation methods and reducing the risks associated with human error or navigational mistakes. The study explores the benefits of GNSS, such as increased accuracy, operational efficiency, and fuel consumption reduction through optimized route planning. Additionally, the study addresses challenges related to signal interference, vulnerabilities in remote*

areas or extreme weather conditions, and the importance of international regulations to ensure the interoperability and continuity of GNSS services in maritime navigation.

Keywords: *maritime navigation, satellite systems (GNSS)*

98. (ID 125) Safety Assessment of Maritime Transport Operations of Dangerous Goods

Author: stud. Fabian-Vlad PAVALASCU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Content*

•*Introduction*

•*Legal and regulatory framework*

•*Safety assessment steps*

•*Classification of dangerous goods (IMDG)*

•*Risk analysis, control and prevention measures*

•*The role of the actors involved*

•*Tools used*

•*Conclusions*

Loading...

Introduction

The importance of maritime transport

•*Maritime transport accounts for over 80% of world trade.*

•*It is the most efficient mode of transport for large quantities over long distances.*

Dangerous goods – a constant reality

•*Over 50 million containers transported annually contain hazardous substances (chemicals, gases, flammable materials, radioactive materials, etc.).*

•*Improper handling can lead to fires, explosions, toxic spills and severe marine pollution.*

Legal and regulatory framework

•*IMDG Code – Classification, Packaging, Documentation*

•*SOLAS – Safety of Ships*

•*MARPOL – Pollution Prevention*

•*National Legislation – Compliance with International Regulations*

Loading...

Safety assessment steps

1. Dangerous Goods Identification

2.Hazard Analysis

3.Control Measures

4.Ship and Port Compatibility

5.Emergency and Response Plans

Classification of dangerous goods (IMDG)

- Class 1 – Explosives*

- Class 2 – Gases*

- Class 3 – Flammable liquids*

- Class 4 – Flammable solids / Self-reactive substances*

- Class 5 – Oxidizing substances and organic peroxides*

- Class 6 – Toxic and infectious substances*

- Class 7 – Radioactive materials*

- Class 8 – Corrosive substances*

- Class 9 – Other dangerous substances*

Risk analysis, control and prevention measures

It is the process of identifying, assessing and prioritizing the risks associated with the handling and transport of dangerous goods.

Types of risks:

1.Physical and chemical hazards

2.Risks to staff health

3.Operational risks

4.Environmental risks

Control and prevention measures

- Proper packaging and labeling*

- Staff training*

- Standard handling procedures*

- Protective equipment*

The role of the actors involved

- Shipper – Classification and packaging*

- Carrier/vessel – Safe means*

- Authorities – Control and regulation*

- Crew – Application of procedures*

Tools used

- Safety Data Sheets (SDS)*

- Essential information about each substance: Composition, Hazards, Protective measures, Action in case of an incident*

- Checklists*

- Used before, during and after operations*

- Examples: Container control, Confirmation of stacking compatibility, Document validation*
- ISM (International Safety Management Code) System*
- Framework for safety management on board ships*
- Includes: Safety policies, Non-compliance reports, Emergency procedures, Periodic audits*

Conclusions

1. Safety is not optional, but essential

- The maritime transport of dangerous goods involves significant risks to people, the ship, ports and the environment.*
- Safety must be treated as a collective responsibility – from the shipper, to the crew, authorities and port operators.*

2. Regulations save lives

- Compliance with international standards (IMDG, SOLAS, MARPOL) is key to preventing accidents.*
- Implementing a solid risk assessment and management system drastically reduces the likelihood of incidents.*

3. Protecting the marine environment is a global priority

- A dangerous goods incident can have devastating environmental consequences.*
- Good maritime practice also means responsibility towards future generations.*

Keywords: *Save lives, tools, safety*

99. (ID 127) Strategies to Reduce Carbon Emissions in Maritime Transport

Author: stud. David Andrei PETROVICI

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The project explores various strategies to reduce carbon emissions in the maritime transport sector. It presents a combination of technological advancements, operational improvements, alternative fuels, regulatory policies, and innovative digital solutions.*

- *Technological strategies include upgrading to more efficient engines, optimizing ship hull designs, and using alternative propulsion methods such as LNG, hydrogen, ammonia, and wind-assisted systems.*

- *Operational strategies focus on reducing ship speed (slow steaming), optimizing routes, performing proactive maintenance, and improving cargo management.*
 - *Fuel-related measures involve switching to low-sulphur fuels, LNG, biofuels, and developing carbon-free options like green hydrogen and ammonia.*
 - *Regulatory measures are enforced by bodies like the IMO and the EU, aiming for emission reductions through mechanisms like the EEDI, SEEMP, and EU ETS.*
 - *Innovative and digital solutions utilize IoT, AI, and energy management systems to enhance efficiency. Route optimization and autonomous ships also offer significant potential.*
- The conclusion emphasizes that a sustainable maritime future requires an integrated approach combining all these strategies.*

100. (ID 132) Computer-Assisted Study of Ship Geometry

Author: stud. Alexandru-Ștefan BEREĂ

Scientific Advisor: Asoc.Prof.Dr.Eng. Mihaela-Greti MANEA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The complex geometric shapes of ship hulls require the use of specialized software licenses. AutoCAD and its derivative licenses are not sufficiently capable for this purpose. This paper proposes the study of ship geometry using the AutoShip and Octopus licenses available at “Mircea cel Bătrân” Naval Academy. For illustration purposes, a hull similar to that of a logistic support vessel from the Romanian Naval Forces was used.*

Keywords: *geometric shapes, ship hull, software licenses, AutoShip, Octopus*

101. (ID 133) Innovative Solutions for the Optimal Management of Maritime Traffic

Authors: stud. Teodor MELINTIOI, stud. Alexandru MIRICA

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Efficient management of maritime traffic is essential for the security, sustainability and efficiency of global maritime transport. In the context of the constant growth of traffic volume and the complexity of port operations, the implementation of innovative*

solutions for its optimization is becoming increasingly urgent. One of the most promising directions is the integration of advanced navigation systems, which use state-of-the-art sensors and machine learning algorithms to anticipate and minimize the risks of collision and congestion. In parallel, satellite communication technologies and the Internet of Things (IoT) can facilitate the exchange of information in real time between ships and port authorities, thus contributing to better coordination of activities. Also, the optimization of maritime routes, using computer simulations and historical data analysis, can contribute to reducing greenhouse gas emissions and saving fuel. In conclusion, innovative solutions for maritime traffic management will not only increase efficiency and safety, but will also contribute to a more sustainable future of the maritime industry. These technological developments are essential to meet the global challenges of continued trade growth and environmental protection.

Keywords: *satellite communication, technologies, Internet of Things*

102. (ID 134) Energy Efficiency of Naval Equipment and Systems

Authors: stud. Razvan-Gabriel LUNGU, stud. Iustin-Gabriel HODOROG

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In the context of increasingly strict international regulations on carbon emissions and the need to reduce the negative impact of maritime activities on the environment, optimizing energy consumption is becoming a key factor in the sustainable development of navigation. One of the fundamental steps in this regard is the adoption of more efficient technologies for ship propulsion. Modern, more efficient and economical engines, equipped with energy recovery systems, such as gas turbines and hybrid propulsion, contribute significantly to reducing fuel consumption. Also, the integration of alternative energy sources, such as solar panels and wind turbines, can support the process of reducing dependence on fossil fuels, thus contributing to the reduction of CO2 emissions. Regarding onboard power and lighting systems, their modernization through the use of LED technologies, the energy efficiency of refrigeration and air conditioning equipment can lead to significant*

energy savings. Implementing intelligent energy management systems on board, which monitor and optimize consumption in real time, can ensure a more rational use of energy resources, contributing to reducing global consumption. The use of lightweight materials and special painting technologies that minimize friction with water can reduce fuel consumption and increase ship performance. The use of lightweight materials and special painting technologies that minimize friction with water can reduce fuel consumption and increase ship performance. In conclusion, energy efficiency of naval equipment and systems is a field of research and development with a significant impact on the sustainability of the maritime industry. All of this will contribute to reducing energy consumption and emissions, ensuring greener and more economical navigation.

Keywords: *intelligent energy, energy efficiency, alternative energy*

103. (ID 138) Digitization of Navigation Systems

Authors: stud. Iustin-Gabriel HODOROG, stud. Razvan-Gabriel LUNGU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The digitalization of navigation systems is an essential step in the modernization of the maritime industry, having a significant impact on the safety, efficiency and sustainability of naval operations. Digital technologies have transformed the way ships are led, monitored and managed, offering innovative solutions that improve performance and reduce the risks associated with navigation at sea. One of the most important aspects of the digitalization of navigation systems is the integration of advanced technologies such as GPS, digital radar, AIS (Automatic Identification System) equipment and ECDIS (Electronic Chart Display and Information System) systems. These technologies allow constant monitoring of the ship's position, weather conditions and maritime traffic, providing the crew with real-time information about the environment and possible dangers. Digital navigation systems are also connected to satellite communication networks, which allow the rapid exchange of information between ships and ground control centers or port authorities. The digitalization of navigation systems also allows the implementation of solutions for optimizing navigation routes. By*

analyzing historical data and real-time weather conditions, the systems can recommend routes that minimize fuel consumption, reduce CO2 emissions and improve the energy efficiency of ships

Keywords: *satellite communication, digitalization systems, optimizing navigation routes*

104. (ID 140) Development Trends of River Ports

Author: stud. Daniel SMARANDESCU

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper discusses the development trends of river ports, especially on the Mississippi River. The paper will present emerging technologies in river navigation, infrastructure modernization projects, and sustainability and environmental protection policies. The presentation part, which includes emerging technologies in river navigation, will discuss autonomous ships, advanced environmental perception systems, and other technologies that will aid river navigation. The work will include infrastructure modernization projects, sustainability and environmental protection policies that focus on increasing the flow of goods and minimizing the effect of climate change on river navigation.*

Keywords: *development, climate change, Mississippi River*

105. (ID 141) The Impact of Digitalization on Navigation and Maritime Transport

Authors: stud. Elvin-Erol FEIZULA, stud. Cristian KISCANEANU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In recent decades, digitalization has dramatically transformed the maritime transport industry, introducing innovative technological solutions that enhance efficiency, safety, and sustainability. Advanced navigation systems, automation, the Internet of Things (IoT), and real-time data analytics have revolutionized how ships are managed and operated. Digitalization enables constant monitoring of navigation conditions, route optimization, improved communication between vessels and ports, and reduced human error, leading to enhanced safety in maritime transport. Additionally, the integration of blockchain-based solutions addresses challenges*

related to transparency and efficiency in logistical processes. However, the transition to a fully digitalized system is not without its challenges, including cybersecurity concerns, the need for a global regulatory framework, and the adaptation of existing infrastructure. This abstract explores how digitalization is reshaping the operational processes of maritime transport and its impact on economic and environmental strategies. Finally, it emphasizes the necessity for continued development and implementation of technological solutions to meet the demands of an increasingly interconnected and sustainable maritime industry.

Keywords: *digitalization, innovative technological, solutions*

106. (ID 142) Innovations and Challenges in Contemporary Maritime Navigation and Transport

Authors: stud. Cristian KISCANEANU, stud. Elvin-Erol FEIZULA

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The maritime navigation and transport industry has undergone significant transformations in recent decades, driven by technological advancements, environmental regulations, and global economic demands. Innovations such as autonomous vessels, advanced navigation systems, artificial intelligence, and the integration of the Internet of Things (IoT) and Big Data have greatly enhanced the efficiency, safety, and sustainability of maritime operations. Technologies like blockchain have also streamlined logistics and improved transparency in maritime supply chains. However, these innovations come with substantial challenges, including cybersecurity risks, the integration of new technologies with traditional infrastructure, and the need for rapidly evolving international regulations. Moreover, the growing impact of climate change has introduced additional pressure on the industry, necessitating more sustainable practices and reducing carbon emissions. This abstract explores both the innovations shaping the future of maritime transport and the challenges the sector faces in adapting to these changes. It also discusses the economic and environmental impacts of these innovations on the global maritime industry.*

Keywords: *Innovations, Big Data, cybersecurity*

107. (ID 146) Study on the Organization and Management of SAR Operations Onboard of a Container Ship with a Capacity of 19,000 TEU

Author: stud. Andrei-Catalin GHEORGHIU

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

***Abstract:** Maritime search and rescue is an important function of saving lives of sailors, passengers in danger or survivors of aviation accidents. Dependent on the country, the missions can be executed by the coast guard, the military navy or even volunteer organizations. When a vessel in distress is sighted, the rescue teams would launch helicopters, boats that are suitable for rescue or even other ships to evacuate people in danger and bring them safely to the shore. However, in some instances, combined air-sea rescue (ASR) is used which involves the use of air craft (flying boats, amphibious helicopters, or hoist equipped helicopters) and surface vessels. (SAR) operations are accompanied by a number of problems, which are especially relevant to the issue of timely response and effective coordination in the case of an emergency. This leads to difficulties in finding and rescuing people in the vast ocean with its unpredictable and sometimes harsh climate conditions. In such conditions, traditional methods of communication may fail that may prove to be crucial in reducing the survival chances of the victims. For the SAR operations to be effective there is a need to have cooperation between ships, aircraft and rescue coordination centres. Any delay can have severe consequences and that is why communication systems have to be fast and strong. Current technologies like satellite positioning and digital communication play an important role in enhancing the efficiency of these missions through improved reaction time. Also, the standardization of procedures and the training of intervention teams to use new technologies are important measures that contribute to the improvement of these rescue operations.*

108. (ID 494) Navigation and Logistics Parameters of the Maritime Route Between the Port of New York and the Port of Odesa

Authors: stud. Alba-Smaranda CHIRIAC, stud. Andrei-Mircea CAPATANA

Scientific Advisor: Captain Senior Lecturer Dr. Ing. Andra-Teodora NEDELCU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this project, we have shown the maritime journey of the container ship ANDROMEDA, which is operated by the global shipping company CMA CGM. The vessel embarks on a transoceanic voyage from Port of New York, one of the largest and most active ports on the U.S. East Coast, to Port of Odesa, Ukraine. The distance of route is approximately 6024 nautical miles and is scheduled to be completed in 10 days and 12 hours. This journey is not only a logistical challenge but also a complex navigation task that requires careful planning through various climatic and geographical zones. The voyage takes the ship across the vast Atlantic Ocean, through the narrow and busy Strait of Gibraltar, and into the waters of the Mediterranean. From there, the ship continues through multiple seas and straits before finally reaching Odesa, marking a significant international trade route.*

Keywords: navigation voyage route transoceanic shipping

109. (ID 148) The Use of Hydrogen and Ammonia in Decarbonizing Maritime Transport

Authors: stud. Cosmina BĂDĂRĂU, stud. Maria-Bianca SCURTU

Scientific Advisor: Captain Senior Lecturer Dr. Ing. Andra-Teodora NEDELCU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Shipping contributes about 3% of global CO₂ emissions, prompting the IMO to impose stringent targets: 30% emission reduction by 2030, 70% by 2040 and zero emissions by 2050. Hydrogen is a clean fuel, usable in fuel cells and modified engines, but it is expensive and requires storage at -253°C. Ammonia is easier to transport and can be used directly in engines, but is toxic and less energy efficient. Developing the infrastructure for production, transportation and distribution is essential. The first hydrogen and*

ammonia-powered merchant ships are expected by 2030, with large-scale uptake to be phased in by 2050. Shipping companies are investing in hybrid technologies, combining alternative fuels for maximum efficiency. The transition requires collaboration between governments, operators and fuel producers, but it is essential for a sustainable future for shipping.

Keywords: Maritime transport, Eco-friendly fuels, Zero emissions, Decarbonization

110. (ID 155) Fire Fighting Techniques and Pollution Prevention

Author: stud. Giulia-Diana TĂMAȘ

Scientific Advisor: Captain Assoc. prof. Atodiresei Dinu-Vasile, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project explores the methods and resources available for combating fires and preventing marine pollution on container ships. With the rise of containerization as a key driver in global maritime logistics, new challenges have emerged, particularly regarding the safe transport of hazardous goods and the protection of the marine environment. The structural layout of container vessels makes fire intervention extremely difficult due to dense stacking and restricted access, rendering traditional methods like CO₂ suppression less effective. Additionally, undeclared or improperly labeled dangerous cargo significantly increases the risk of onboard fires. The study presents both traditional and modern fire prevention strategies, including the use of AI-based detection systems, improved logistics automation, and strict international regulations imposed by organizations like the IMO. It also highlights the critical importance of crew training, since human error is responsible for more than 75% of maritime incidents. The research is complemented by a real-life case study observed during my cadetship, which demonstrates the impact of undeclared dangerous goods on emergency response efficiency. The paper aims to identify practical, sustainable, and regulation-compliant solutions to support safer maritime navigation in the container shipping industry.*

Keywords: Container ships, Fire prevention, Marine pollution, Hazardous cargo, Maritime safety, Emergency response, AI detection

systems, Crew training, IMO regulations, Environmental protection, Maritime logistic, Risk management

111. (ID 161) Beyond the Horizon: Protecting Global Sea Lanes

Authors: stud. Maria-Adelina VLAD, stud. Laurențiu-Mihai MEIANU

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project focuses on international maritime security and the global efforts to keep the world's oceans safe. With more than 90% of international trade carried by sea, protecting maritime routes is essential for global stability and economic growth. The project looks at the most important threats that affect international waters. It also explores how countries work together through international laws, agreements, and organizations to respond to these challenges. Technologies like satellite tracking, coastal surveillance, and automated identification systems (AIS) are also discussed as tools that help improve safety at sea. The project highlights the importance of cooperation, information sharing, and strong global partnerships in maintaining secure and open seas for all nations.*

Keywords: *maritime security, challenges, safe waters*

112. (ID 162) Smart Ports and Digitalization in the Era of Industry 4.0 – Case Studies: Singapore, Rotterdam, and Hamburg

Authors: stud. Andrei-Iulian DUMBRAVA, stud. Mihaela JIANU

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The digital transformation of maritime ports represents a crucial aspect of the industry 4.0 revolution, fundamentally changing logistics infrastructure globally. Ports like Singapore, Rotterdam, and Hamburg are leading this transformation by extensively adopting advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), blockchain, and digital twins to optimize operations, enhance sustainability, and increase efficiency. Leading Smart Ports demonstrate the practical implementation of digital innovation through intelligent infrastructure, automated operations, real-time tracking, and predictive analytics. Through these case*

studies, the paper illustrates how Industry 4.0 technologies are reshaping port management by improving operational efficiency, reducing environmental impacts, and promoting sustainability in maritime logistics.

Keywords: *Smart ports, Industry 4.0, Digital Transformation*

113. (ID 164) Study Regarding the Sar (Search and Rescue) System in Netherlands

Author: stud. Gabriel Stefan LUCA

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study presents an overview of the Search and Rescue (SAR) system in the Netherlands. It highlights the organizational structure, key agencies involved, operational procedures, and technological resources used.*

Keywords: *SAR, system*

114. (ID 167) Study on Methods of Evacuating 1000 People Aboard a Passenger Ship with A Major Fire Onboard

Author: stud. Mihai-Gabriel DUMITRU

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores effective evacuation methods for 1000 passengers on a ship during a major fire, focusing on safety protocols, speed, efficiency, minimizing risk, and ensuring orderly evacuation in emergency situations.*

Keywords: *evacuation; safety; fire*

115. (ID 168) Study on The Organization and Management of Sar Operations Aboard an Oil Tanker with A Capacity of 150,000 Dwt

Author: stud. Aksun GEAUZAR

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study examines the organization and management of Search and Rescue (SAR) operations aboard an oil tanker with a 150,000 DWT capacity, focusing on operational procedures,*

coordination, resource management, and ensuring effective response to emergencies at sea.

Keywords: SAR; oil tanker; emergencies

116. (ID 175) Safety of Life at Sea - A Causal Chain Approach Associated with Damage to The Structural Integrity of The Ship

Author: stud. Alina-Elena CRĂCIUN

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Ensuring the safety of life at sea remains a critical priority in maritime operations, particularly when structural failures pose significant threats to both crew and vessel. This thesis explores the interconnection between structural integrity and maritime safety using a causal chain approach. By analyzing incidents and near-misses where damage to a ship’s structure led to hazardous situations, the study identifies recurring failure modes, contributing factors, and system vulnerabilities. The research integrates case studies, regulatory frameworks (including SOLAS), and engineering assessments to map how initial damage can escalate into life-threatening emergencies. Through this analysis, the thesis proposes a model to break critical links in the causal chain, aiming to enhance early detection, improve damage control protocols, and inform design and operational safeguards. The findings advocate for a more holistic and predictive approach to structural safety that not only protects vessels but ultimately preserves lives at sea.*

Keywords: safety, maritime, failure, damage, hazardous situation, study, vulnerabilities, emergencies.

117. (ID 176) Analysis of the Impact of Fires on the Safety of Container Ships

Author: stud. Constantin Adam

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the critical issue of fire hazards on board container ships and their implications for maritime safety, cargo integrity, and environmental protection. The study begins with an overview of container vessels, including their structure, capacity, and global economic role. It then analyzes the most frequent causes*

of fires, such as hazardous cargo, human error, electrical faults, and improper stowage or labeling of containers. Vulnerable areas aboard the vessel are identified, including the cargo hold, engine room, bridge, and crew quarters, all of which present unique fire risks. The research highlights the onboard firefighting and prevention equipment, including CO₂ systems, water sprinklers, temperature sensors, and portable extinguishers, as well as safety protocols such as crew training, fire drills, and equipment inspections. Case studies of real incidents, such as MSC Flaminia and Maersk Honam, illustrate the devastating consequences of shipboard fires. The analysis continues with an evaluation of the economic and environmental impacts, such as cargo loss, supply chain disruption, toxic emissions, and marine pollution. Finally, the paper offers recommendations aimed at improving fire detection, prevention, emergency procedures, and international regulatory compliance. The study concludes that enhancing fire safety on container ships is not only a technical challenge but a global necessity with economic, human, and ecological dimensions.

Keywords: *analiza*

118. (ID 178) Australia's International Trade Study. Statistical Research, 2000-2025

Author: stud. Samer-Ahmad KINJ

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study provides a statistical analysis of Australia's international trade between the years 2000 and 2025. It explores the evolution of Australia's economy, highlighting key sectors of its economy, with an emphasis on its maritime industries.*

Keywords: *Australia, international trade, immigration, maritime economy, export trends, economic development*

119. (ID 180) Elements of Interest of the Naval Forces in the River-Maritime Area.

Authors: stud. Marius Stadoleanu, stud. George Hont

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The river-maritime area represents a strategic zone of significant importance for national and regional security, as well as for economic and environmental stability. For the Naval Forces, this area encompasses a complex operational environment that requires a multidimensional approach in terms of surveillance, control, and defense. Key elements of interest include the protection of critical infrastructure such as ports, shipping routes, and industrial facilities, which are essential for maintaining the flow of goods and services. Additionally, ensuring freedom of navigation and preventing illicit activities like smuggling, trafficking, or unauthorized crossings are core responsibilities. From a military perspective, the river-maritime area offers both opportunities and challenges. The diverse geography, characterized by shallow waters, narrow channels, and proximity to land, demands specialized vessels and tailored tactics. The Naval Forces must also maintain constant situational awareness through the use of modern technologies such as radar systems, drones, and satellite surveillance. Cooperation with other institutions such as border police, coast guard, and environmental agencies is essential for a comprehensive and effective presence. Furthermore, the river-maritime zone plays a key role in crisis management and humanitarian operations, especially in areas prone to natural disasters or environmental incidents. In such cases, naval units can provide rapid intervention, search and rescue capabilities, and logistical support. In conclusion, the river-maritime area is a dynamic and sensitive environment, where the Naval Forces must adapt and act proactively to ensure security, uphold the rule of law, and support civilian authorities when needed.*

Keywords: *Maritime Infrastructure, Strategic Zone, Naval Forces, Critical Infrastructure*

120. (ID 183) Operation of Bulk Carrier Vessels - The Issue of Liquefaction of Certain Types of Cargo

Author: stud. Larisia-Maria PEPTANARIU

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The operation of bulk carrier vessels is a complex process that involves the transportation of bulk goods, essential for the global economy. One of the significant risks associated with this type of*

vessel is the liquefaction of certain types of cargo, a phenomenon that can compromise both the safety of the vessel and the integrity of the cargo. Liquefaction refers to the process by which cargo particles, particularly fine and wet ones, form a liquid layer or a fluid mass, altering their behavior and increasing the risks of instability on board the vessel. This phenomenon can lead to a change in weight distribution, resulting in an increased risk of capsizing or accidents. The paper explores the causes and mechanisms of liquefaction, particularly in the case of cargoes such as iron ore, coal, or grains, which are highly sensitive to variations in humidity and temperature. It also analyzes methods for preventing and managing this risk, including the use of modern technologies for monitoring cargo and climate conditions. Securing the cargo and ensuring safe transport are fundamental objectives, and international regulations, such as those established by the IMO and the ISGOTT Code, provide a necessary legislative framework for protecting both the crew and the vessel. In conclusion, the liquefaction of bulk cargoes represents a significant issue in the operation of bulk carrier vessels, and preventing this phenomenon requires close collaboration between operators, authorities, and the maritime industry. Technological innovations and adherence to safety regulations are essential for ensuring the safe and efficient operation of bulk carrier vessels.

Keywords: *bulk carrier vessels, cargo liquefaction, vessel safety, bulk cargo, risk management, maritime transport.*

121. (ID 184) Preparing and conducting management system audits on board ships. Case study: integrated system audit on container ships

Authors: stud. Camelia Bianca STEFAN, stud. Madalina Valentina TUDOSE, stud. Madalin Andrei SURUIANU

Scientific Advisor: Asist.univ.drd.ing. Livia RAUCA

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the preparation and execution of management system audits on board ships, with a focus on integrated system audits conducted on containerships. The study highlights the importance of structured audit planning, effective implementation, and compliance with international standards such as the ISM Code*

and ISO frameworks. Through a case study approach, the research examines the audit process applied to integrated management systems aboard port container vessels, identifying best practices, challenges, and areas for improvement. Emphasis is placed on the auditor's role, crew involvement, documentation review, and the evaluation of operational and safety procedures. The findings contribute to a deeper understanding of how audit outcomes can enhance safety, efficiency, and environmental performance in maritime operations.

Keywords: *Management system audit, containerships, integrated audit, ISM Code, maritime safety, ISO standards, shipboard operations, audit process, compliance, maritime management systems*

122. (ID 185) Challenges and Opportunities of Implementing Electric Tugboats

Author: stud. Elis EMIN

Scientific Advisor: Nicoleta ACOMI

Institution: Constanta Maritime University

Abstract: *In response to the International Maritime Organization's (IMO) mandate to reduce greenhouse gas emissions by 50% by the year 2050, the maritime industry is increasingly prioritizing sustainable practices. One prominent example is the Greenport initiative, which aims to promote environmental responsibility and reduce emissions across all port-related operations. Among the emerging solutions to support these sustainability goals is the introduction of electric tugboats, which are gaining momentum as a viable alternative to traditional diesel-powered vessels. Electric tugboats offer a range of benefits, most notably the potential to drastically lower emissions and minimize environmental harm. Unlike conventional tugs, electric models operate with zero emissions at the point of use, thereby significantly reducing both air and water pollution in busy port areas. This cleaner operation not only aligns with international efforts to combat climate change but also contributes to healthier conditions for surrounding communities and ecosystems. The shift towards electric propulsion is a strategic move that positions ports and shipping companies as proactive leaders in reducing their environmental impact and carbon footprint.*

However, the transition to electric tugboats is not without its challenges. A key obstacle lies in the high initial investment required—not only for the acquisition of electric tugboats themselves but also for the development of reliable charging infrastructure. Although these vessels may offer lower long-term operating costs due to reduced fuel consumption and maintenance needs, the significant upfront expenditures can be prohibitive, especially for smaller operators or ports with limited budgets. Ultimately, the decision to adopt electric tugboats involves a careful weighing of their benefits and limitations. While the environmental and operational advantages are compelling, stakeholders must consider factors such as infrastructure development, technological maturity, and financial feasibility. With thoughtful planning and strategic investment, the maritime sector can overcome these challenges and fully leverage electric propulsion technology to foster innovation, enhance sustainability, and achieve long-term economic and ecological objectives.

Keywords: *electric tugboat, emissions, CO2*

123. (ID 187) Study on Austria's international trade, statistical research 2000-2025

Authors: stud. Madalin Andrei SURUIANU, stud. Camelia Bianca STEFAN, stud. Madalina Valentina TUDOSE

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study provides a comprehensive analysis of Austria's international trade between 2000 and 2025, employing statistical methods to examine trends, patterns, and structural shifts in both exports and imports. Using data from national and international trade databases, the research identifies key trading partners, the evolution of trade balances, and the diversification of traded goods and services. The study also investigates the impact of major global events, including EU enlargement, the 2008 financial crisis, and the COVID-19 pandemic, on Austria's trade dynamics. Particular attention is given to Austria's position within the European Union's single market and its role in global value chains. The findings reveal significant transformations in Austria's trade structure, driven by technological advancement, regional integration, and changing*

global demand. This research contributes to a deeper understanding of the long-term development of Austria's trade policy and its strategic economic positioning in the global marketplace.

Keywords: *Austria, international trade, trade statistics, exports, imports, European Union, trade balance, economic integration, global value chains, 2000–2025*

124. (ID 188) Study on Cargo Handling Operations on board 60,000 DWT Bulk Carriers

Authors: stud. Matei-Gabriel BUCUR, stud. David-Ciprian CHIRICA

Scientific Advisor: Lecturer eng. Dumitru CORDUNEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study analyzes the cargo handling operational characteristics on 60,000 DWT capacity bulk carriers. Emphasis is placed on procedures, equipment and safety procedures for loading, stowage, and unloading of cargo. The paper analyzes the efficiency of cargo operations in relation to vessel design, port infrastructure and operational practices. By pointing out best practices and areas of improvement, this study aims to assist in the optimization of cargo handling on medium-sized bulk carriers, both in terms of operational effectiveness and maritime safety.*

Keywords: *Cargo, Bulk Carrier, Stowage, Safety*

II. SECTION: ENGINEERING AND MANAGEMENT

Section Committee:

Chairman: Assoc. prof. Gheorghe GRECU, PhD

Members: Assoc. prof. Rita-Elena AVRAM, PhD

Instr. Dragoș SIMION, PhD student

Stud. Mădălina FRĂȚILĂ

Stud. Fabiola-Paula RUSU

Stud. Ana-Gabriela BALUȚĂ

Stud. Ștefania MIHAI

Room: L120

1. (ID 11) UAS engineering and deployment: A practical and interactive DIY guide for FPV drones

Author: stud. Teodor-Mihail GIURGICĂ

Scientific Advisor: Associate professor Annamaria SÂRBU, PhD

Institution: Land Forces Academy 'Nicolae Bălcescu' Sibiu

Abstract: *The rapid evolution of FPV drones has revolutionized modern warfare, providing cost-effective solutions for reconnaissance, precision strikes, and electronic warfare. This research explores their tactical efficiency, battlefield impact, and the strategic advantages of scalable, low-cost drone production. Additionally, we present an interactive, step-by-step DIY guide enabling civilians and military personnel to construct and deploy FPV drones without prior expertise. By integrating drone warfare with emerging battlefield technologies, this project highlights the growing role of decentralized drone operations in hybrid conflicts, emphasizing their strategic and operational implications.*

Keywords: *FPV drones, tactical efficiency, asymmetric warfare, electronic warfare, low-cost UAVs, drone swarms, battlefield innovation, DIY drone construction, military technology, strategic impact.*

2. (ID 27) The Role of Customs Authorities in Combating Tax Evasion in Romanian Ports

Authors: stud. Briana-Ioana REGEPI, stud. Mario-Petru GEAMALINGA, stud. Mario Mihai ȚĂPURIN

Scientific Advisor: Maria ȘERBĂNESCU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes the role of customs authorities in combating tax evasion in Romanian ports, highlighting control measures, the use of modern technologies and the importance of international cooperation. The challenges, types of customs fraud and proposals for improving efficiency in preventing tax evasion and protecting the economy are discussed.*

Keywords: *Evaziune fiscală, autorități vamale, contrabandă, control vamal, digitalizare.*

3. (ID 44) Introducing SxStyle: Where Urban Meets Creativity

Author: stud. Sebastian Ilie DUMITRU

Scientific Advisor: Assoc. Prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *SxStyle is an innovative brand that merges urban fashion with creativity and self-expression. Founded by a young, passionate designer, the brand promotes diversity and freedom of style, offering unique clothing and accessories inspired by street culture. SxStyle's mission is to encourage individuality through versatile, customizable, and sustainable pieces made from premium materials.*

Keywords: *Personalized Clothing, Versatile Clothing, Influencer Collaborations, Sustainable Fashion, Customizable Apparel, Fashion Diversity*

4. (ID 45) Sales at a Click Away

Authors: stud. Bianca-Maria SCARLAT, stud. Lavinia UNGUREANU

Scientific Advisor: Assoc. Prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes the rapid evolution of Romania's e-commerce market, detailing its historical development, present state, and future trajectory. It explores fundamental e-commerce categories (B2C, B2B, C2C) and traces the shift from initial internet adoption to*

widespread digital commerce. The interaction between traditional and online retail is examined, focusing on adaptation strategies and challenges. Future growth is anticipated, fueled by increased internet connectivity and evolving consumer demand, while addressing logistical and cybersecurity considerations. The project emphasizes the necessity of adaptability and innovation for businesses operating within Romania's dynamic e-commerce landscape.

Keywords: *E-commerce, Consumer, Evolution, Digital, Adaptability*

5. (ID 52) From 0 to 1

Authors: stud. Dan PĂTRAȘCU, stud. Bogdan COȘUG

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores BMW's evolution from critical financial moments to becoming one of the world's most prestigious automobile manufacturers. After World War II, the company went through a difficult period, coming close to bankruptcy in 1959. However, with the launch of the BMW 700 model and the strategic decisions of engineer Herbert Quandt, the brand managed to recover and secure its future.*

Keywords: *BMW, bankruptcy, success, strategy, innovation, automotive, marketing, performance*

6. (ID 54) Analysis of Technical and Economic Performances Regarding the Operation of Bulk Cargo on the Example of a Special Operator in the Constanta Seaport

Author: stud. Emilia MARTIN

Scientific Advisor: Col. Assoc. prof. Cătălin POPA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes the technical and economic performance of bulk cargo operations through the example of a specialized operator in the maritime port of Constanța. The main objective of the study is to evaluate the efficiency of logistics processes and propose optimization solutions based on technical and economic indicators to enhance the operator's competitiveness within maritime transport. The project involved comprehensive documentation on bulk cargo operations at both national and international levels, addressing industry challenges and current trends. The analysis incorporated statistical methods, cost and time*

calculations, and a comparative evaluation, and a comparative evaluation with similar ports. Collected data were processed using quantitative methods and theoretical models to assess economic and operational efficiency. Proposed optimization solutions include modernizing infrastructure and equipment, digitizing logistics processes, and implementing sustainable practices. These measures are supported by detailed cost calculations and an analysis of their economic and social impact on the industry.

Keywords: *tehnical; economic; indicators; maritim transport*

7. (ID 55) The Tech-Savvy Generation

Author: stud. Elena-Florentina ION (Iordache)

Scientific Advisor: Assoc. Prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The current generation, often referred to as Generation Z or Generation Alpha, is the first to grow up in a fully interconnected digital environment. Constant internet access, intensive use of smart devices, and the integration of technology into education and social life have shaped a new kind of digital competence. This project examines the impact of technology use on cognitive, social, and professional skills, the associated challenges, and the future of this generation in relation to rapid technological progress.*

Keywords: *Z Generation, The Future of the Digital Generation, Multitasking, Connectivity, Cybersecurity*

8. (ID 56) The Underground Economy in Romania

Authors: stud. Diana-Ioana POPESCU, stud. Alexandra Georgiana PĂUNESCU

Scientific Advisor: Assoc. Prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The underground economy represents one of the biggest economic challenges for Romania, significantly impacting budget revenues and sustainable development. This phenomenon includes activities such as tax evasion, undeclared work, and smuggling, which contribute to massive losses in VAT and uncollected taxes. Although authorities have implemented measures to combat it, further digitalization and stricter controls are necessary to reduce the fiscal gap and improve economic transparency.*

Keywords: *underground economy, tax evasion, undeclared work, VAT*

9. (ID 67) Emotional Intelligence in Leadership: An Essential Factor for Success

Author: stud. Bianca-Maria ISAIA

Scientific Advisor: Assoc. Prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Emotional intelligence (EI) has become a crucial determinant of effective leadership in today’s dynamic and complex business environment. This paper explores the role of EI in leadership, emphasizing how self-awareness, self-regulation, motivation, empathy, and social skills contribute to a leader’s success. Leaders with high EI can navigate interpersonal relationships more effectively, manage conflicts, and inspire teams towards shared goals. Furthermore, EI fosters resilience and adaptability, essential qualities in uncertain and challenging situations. Organizations that prioritize emotionally intelligent leadership often experience higher employee engagement, improved team performance, and overall business success. The study highlights the importance of integrating EI training into leadership development programs, ensuring that leaders possess not only technical expertise but also the emotional competencies necessary to drive organizational growth and innovation.*

Keywords: *Emotional intelligence, Leadership effectiveness, Empathy, Self-awareness, Social skills, Motivation, Workplace success, Conflict management, Organizational growth, Employee engagement*

10. (ID 68) Responsible Consumption vs. Excessive Consumerism

Author: stud. Bianca-Maria ISAIA

Scientific Advisor: Assoc. Prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In today’s globalized world, the contrast between responsible consumption and excessive consumerism has become increasingly significant. Responsible consumption promotes mindful purchasing, sustainability, and ethical decision-making, encouraging individuals to consider the environmental and social impact of their*

choices. On the other hand, excessive consumerism leads to overconsumption, resource depletion, and increased waste, often driven by aggressive marketing and societal pressure. This paper explores the consequences of both approaches, highlighting the importance of balancing personal needs with ecological responsibility. By adopting responsible consumption habits, individuals and businesses can contribute to a more sustainable future, reducing environmental harm while fostering economic and social well-being. The study emphasizes the need for education, policy changes, and corporate responsibility in promoting sustainable consumer behavior.

Keywords: *Responsible consumption, Excessive consumerism, Sustainability, Ethical consumption, Environmental impact, Overconsumption, Resource depletion, Sustainable living*

11. (ID 80) The Impact of Climate Change on the Global Economy

Authors: stud. Raluca COTORCEA, stud. Denis-Mihai DUMITRACHE

Scientific Advisor: Assoc. prof. Gheorghe GRECU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This project explores the impact of climate change on the economy, analyzing how climate change affects various industries and exacerbates economic inequalities. It explains the concept of climate change and its consequences, including the increasing number of natural disasters and associated economic losses. International initiatives such as the Paris Agreement are presented, along with controversies related to Project Alaska. Finally, solutions are proposed to mitigate the effects of climate change and transition toward a sustainable economy.*

Keywords: *climate change, Paris Agreement, natural disasters, Project Alaska, sustainable economy*

12. (ID 84) Augmented Reality and Virtual Reality Software for General Military Training

Authors: stud. Bogdan TODICĂ, stud. Larisa LUPȘĂ

Scientific Advisor: Col. Laurian GHERMAN

Institution: "Henri Coandă" Air Force Academy

Abstract: *This paper aims to implement augmented reality (AR) and virtual reality (VR) technologies in order to enhance the training process of military personnel at the beginning of basic training. In the context of the evolution of military technologies intended for combat, there is also necessary to innovate in the military educational process. We intend to study the integration of a virtual reality and an augmented reality software for the purpose of developing a better training for our troops by creating an immersive and interactive 3D environment and providing a realistic 3D view of military equipment.*

Keywords: AR, VR, interactive, immersive, 3D

13. (ID 93) The land Market in 2025

Authors: stud. Mircea DAVID, stud. Florentina Andreea BUCUR

Scientific Advisor: Assoc. prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This document explores land prices in Romania, analyzing the differences between urban and rural land, as well as the factors that influence their costs. Urban land is located within buildable areas and is used for residential, commercial, industrial, and infrastructure purposes, with higher prices due to access to utilities and urban development. On the other hand, rural land is situated outside urbanized areas and is intended for agricultural, forestry, or environmental conservation activities, having lower costs.*

Keywords: land, prices, rural land, urban land, investments

14. (ID 94) VIP-ER 180

Authors: stud. Andreea-Claudia SCARLAT, stud. Iulian-Florin STOIAN

Scientific Advisor: Assoc. prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Luxury, in its material and symbolic sense, has evolved according to the social, economic and cultural development of each historical period.*

1. Luxury in Ancient Egypt:

Luxury in ancient Egypt was associated with religion, royal power, and social status. The Pharaohs demonstrated significant economic

consumption, reflected in the construction of grandiose monuments and their luxurious lifestyles.

2. Luxury in Ancient Greece:

In ancient Greece, luxury was associated with aesthetics, refinement, and craftsmanship. The Greeks valued not only luxury material goods (jewelry, fine pottery), but also intellectual stimulation and refined vacations

3. Luxury in Ancient Rome:

Luxury was associated with imperial power and military supremacy, but also with excess and vice, and was a subject of debate in Roman philosophy. The spectacles in the Colosseum, such as gladiator fights, exotic animal fights, and reenactments of historical battles, were organized by emperors to gain popular favor and demonstrate their power.

4. Luxury in the Middle Ages:

Luxury was concentrated in the hands of the nobility and the church. Feudal palaces, royal robes, and imposing churches were symbols of wealth. Luxury goods were often linked to religious and political power, and aristocratic court life was a place for the manifestation of this opulence.

5. Luxury in the Modern Age:

Luxury in the modern age can be understood as a combination of technological innovations, personalized experiences, and attention to detail in various fields, from homes and cars, to fashion and travel.

Keywords: *Luxury, craftsmanship, freedom, evolution, vanity, excess*

15. (ID 97) Three-Dimensional Graphs

Authors: stud. Robert DIACONIȚA, stud. Nicoleta – Raluca TABIRCA

Scientific Advisor: Lecturer Eleonora RĂPEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this paper, we talk about three-dimensional graphs, which represent an advanced way of visualizing data in three dimensions. These graphs are essential for understanding the complex relationships between multiple variables, providing a clear view of the data's behavior in a 3D space.*

Keywords: *Mathlab, graphs*

16. (ID 103) National-Level Analysis of The Relationship Between Inland Waterway Activities, Port Activity, and Territorial Development Plans

Author: stud. Izel MEMEDULA

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This research examines, at the national level, the relationships between inland waterway activities, port operations, and territorial development plans, highlighting the importance of an integrated approach to managing transport infrastructure and adjacent territories. The analysis is based on a detailed assessment of the impact of these activities on regional and national economic development, identifying synergies and conflicts between transport policies and spatial planning strategies. By correlating relevant data, existing regulations, and territorial development strategies, the study highlights existing gaps and proposes solutions for optimizing the interaction between these essential areas. The findings suggest that a more effective alignment of public policies is crucial for the sustainable use of resources and enhancing the competitiveness of ports and inland waterways.*

Keywords: *Inland waterway activities; Port activity; Territorial development plans; Transport infrastructure; Maritime transport; Regional development; Public policies; Spatial planning.*

17. (ID 104) Medium- and Long-Term Forecasting of Logistic Transport Activities on Inland Waterways

Author: stud. Iuliana-Alexandra PINTILIE

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper investigates medium- and long-term forecasting of logistic transport activities on the Romanian sector of the Danube River, a key component of the European inland waterway network. The study emphasizes the strategic importance of the Danube in facilitating sustainable and efficient freight transport, while addressing challenges related to climate variability, infrastructure capacity, and traffic dynamics. Using trend analysis, statistical modeling, and policy review, the research outlines potential scenarios for the evolution of cargo flows and identifies key factors*

influencing future developments. The findings aim to inform strategic decisions for improving the competitiveness and resilience of inland waterway logistics in Romania.

Keywords: *Danube River, inland waterway, transport logistics, forecasting.*

18. (ID 108) Methods to Mitigate the Effects of Cruise Ships on Local and Port Communities

Author: stud. Larisa - Elena GRECU

Scientific Advisor: Commander Assoc. Prof. Alexandru COTORCEA, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *In the maritime industry, the engines that power cruise ships are essential for their performance and efficiency. The maritime industry is currently facing one of the world's major challenges: pollutant emissions and environmental impact. Currently, most cruise ships operate with diesel engines. However, these engines, through the burning of fossil fuels, release CO2 emissions and other pollutants, having a significant impact on the environment. In this context, hydrogen represents a promising alternative, as it is a clean fuel that produces only water vapor as emissions, making it much more environmentally friendly than diesel. Hydrogen technology is not yet as accessible in terms of cost and fueling infrastructure, and its efficiency under the operational conditions of a cruise ship remains a challenge.*

Keywords: *Hydrogen engine, pollution, sustainability*

19. (ID 189) Unyielding Precision: Exploring Robust Face Detection for Secure Access Management

Author: stud. Anisia-Teodora FUGARU

Scientific Advisor: Professor Oliver NIGGEMANN, PhD; Major associate professor Anamaria SARBU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy

Abstract: *Face detection is a critical task in computer vision, forming the backbone of many secure access management systems, including biometric authentication and surveillance. This study investigates a customized Detection Transformer (DETR) framework tailored for robust face detection in real-world environments, addressing challenges*

such as occlusion, variable illumination, and adversarial perturbations. By integrating adaptive attention mechanisms and refining the detection of small and partially obscured faces, the proposed model significantly enhances accuracy and generalization across diverse civilian datasets. Extensive evaluations demonstrate the model's resilience under adverse conditions, positioning it as a viable solution for high-stakes security contexts where precision and reliability are paramount. These findings underscore DETR's potential not only in advancing face perception technology but also in reinforcing secure, intelligent access control systems essential for modern infrastructure.

Keywords: *face detection, Detection Transformers (DETR), robustness, adversarial defense, precision*

20. (ID 195) Analysis of Solutions to Increase Competitiveness in Seaports

Author: stud. Antonia-Elena RAITA

Scientific Advisor: Assoc. prof. eng. Rita Elena AVRAM, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The paper proposes to identify and analyze the main solutions for increasing maritime competitiveness in the context of globalization and the intensification of international trade. Through an integrated approach, both internal factors (operational management, digitalization, infrastructure) and external ones (port policies, collaboration with customs authorities, intermodal transport networks) are evaluated. The case study applied to the port of Constanta highlights the opportunities and challenges specific to the Black Sea region. The results obtained emphasize the importance of investments in modern technologies, the digitalization of logistics flows and regional cooperation to increase the efficiency and attractiveness of ports in the face of international competition.*

Keywords: *seaports, competitiveness, logistics, digitalization, intermodal transport, Constanta port, port infrastructure, international trade*

21. (ID 196) Energy Efficiency in Container Terminals

Author: Bianca-Elena IONESCU

Scientific Advisor: Assoc. prof. eng. Rita Elena AVRAM, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The goal of this study is to introduce an innovative method for evaluating the energy efficiency of crane operations in intermodal terminals within smart ports, specifically focusing on the ship loading process. This study addresses a significant gap in existing research by creating a detailed simulation model using FlexSim, which allows for a comprehensive quantitative analysis of crane energy consumption. It takes into account various factors affecting energy efficiency, such as container placement in the storage yard, rehandling operations, and crane movements. The volume and efficiency of container movements directly affect energy consumption, environmental impact, operational capacity, and port revenues. To optimize port operations and reduce energy use, automated processes and efficient logistics solutions for cargo handling are implemented. Tugboats, powerful and robust for their size, are employed to maneuver ships by pushing or towing.*

Keywords: *Smartports, Containers, Flexsim, Logistics, Ships, Crane*

22. (ID 211) Analysis of Advanced Technologies Adopted to Improve Port Operations Efficiency

Author: stud. Mihai-Gabriel TIMOFEI

Scientific Advisor: Assoc. prof. eng. Rita Elena AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The maritime industry has implemented digital tools and automated systems during recent years to enhance operational efficiency. The research presents an operational solution which combines drones and autonomous boats with ground-based command facilities to deliver vital supplies between ports and ships. The system operates autonomously to execute complete supply delivery tasks without excessive human interaction. GNSS-based positioning serves as the foundation for accuracy while low-power wireless communication and onboard control systems operate together to provide safe delivery. The system addresses communication problems between system components particularly when the drone operates beyond direct visual range or extended distances. The system employs the boat to relay both data and commands as its solution to this problem. The solution follows European drone operation regulations for BVLOS flights and follows U-Space framework guidelines. The system design for port logistics*

operations has the potential to serve multiple purposes including maritime monitoring and search and rescue missions. This approach demonstrates how multiple emerging technologies unite to modernize shipping process automation.

Keywords: *Advanced technologies, Port automation, Autonomous vessels, Maritime logistics*

23. (ID 215) Elasto-Plastic Analysis of Torsion

Authors: stud. Andreea-Ștefana SMÎNTÎNĂ, stud. Andra-Paula SLAV, stud. Ioana Alexandra PATRICHE, stud. Bianca Elena RÎȘITARIU

Scientific Advisor: Assoc. prof. eng. Mihai BEJAN, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper introduces an interactive MATLAB-based application designed to compute the elastic radius of a shaft subjected to torsional loading in the elasto-plastic regime. The user-friendly graphical interface allows for the input of essential parameters—applied torque, yield shear stress, and the shaft's geometry (radius or diameter)—enabling fast and accurate analysis. The algorithm employs the specific analytical expression of elasto-plastic torsion to determine the internal limit of the region still behaving elastically, where the stress distribution deviates from the linearity observed in purely elastic conditions. With built-in unit conversion and input validation, the application ensures both robustness and result accuracy. This tool proves valuable in both educational and engineering contexts, enhancing understanding of material behavior under nonlinear torsional stress.*

Keywords: *elasto-plastic torsion, shaft, yield stress, elastic radius, MATLAB, strength of materials*

24. (ID 221) Methods for Optimizing Cargo Transshipment in Danube Ports

Author: stud. Denisa Georgiana STRATULAT

Scientific Advisor: Commander Assoc. prof. eng. Alexandru COTORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The paper analyzes the current context of Romanian ports on the Danube, highlighting the existing infrastructure, types of*

goods transported, and transshipment operations. Ports such as Galați, Brăila, Tulcea, Giurgiu, Cernavodă, Drobeta-Turnu Severin, and Oltenița play an essential role in Romania's inland waterway logistics network, offering modern facilities for handling general, bulk, and liquid cargo. The Danube represents a major commercial artery, with the advantages of low transport costs, high capacity, and a reduced environmental impact. However, there are also significant challenges, such as underdeveloped infrastructure, low transport speeds, and dependency on weather conditions. Cargo transshipment varies depending on the type of goods and involves specific equipment: ramps for roll-on/roll-off, cranes for containers and general cargo, pneumatic systems or conveyor belts for bulk goods. Port operations are often affected by water level fluctuations, lack of investment, and unfavorable weather conditions, all impacting logistical efficiency. The study emphasizes the need to modernize infrastructure and optimize operations in order to increase the competitiveness of Danube ports.

Keywords: *Inland ports, Transshipment, Danube, Inland navigation*

25. (ID 233) Methods and Strategies to Avoid Losses of Solid Bulk Cargo During Loading-Unloading Operations

Author: stud. Teodora-Daniela CARAMANGIU

Scientific Advisor: Commander Assoc. prof. eng. Alexandru COTORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Handling of bulk solids is a key process in the global logistics chain, with major importance in industries such as agriculture, mining, construction and shipping. These commodities include products such as grains, ores, cement, coal and fertilizers, each with specific characteristics that influence transport, storage and handling methods. To ensure the efficiency of loading and unloading operations, advanced technologies and specialized equipment are used, such as conveyor belts, elevators, pneumatic conveying systems and cranes. Automation and digitalization of processes contribute significantly to reducing material losses and optimizing operational costs. In addition, safety and environmental protection measures play a crucial role in preventing accidents and pollution. The use of protective equipment, dust collection systems*

and covered conveyors are effective solutions to minimize negative environmental impacts. Handling solid bulk goods involves significant risks, from cargo collapse and exposure to toxic dust, to accidents caused by moving equipment. To prevent these hazards and ensure a safe working environment, it is essential to apply strict protective measures and comply with occupational safety regulations.

Keywords: *Strategies, avoid losses, bulk cargo*

26. (ID 234) Cybersecurity and Integrated Naval Defense Systems

Authors: stud. Nectaria-Alexandra TOMA, stud. Florentin Gabriel FLOREA, stud. Ionela DIACONESCU, stud. Gabriela CHIRU, stud. Theodor TOMA

Scientific Advisor: Assoc. prof. Gabriela OPREA, PhD

Abstract: *As modern naval operations grow increasingly reliant on interconnected technologies, the imperative to secure integrated defense systems against cyber threats has never been more critical. The convergence of cyber and maritime domains presents both strategic advantages and heightened vulnerabilities, particularly in complex naval platforms where command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems are fully integrated. Cybersecurity now plays a foundational role in ensuring the operational integrity and resilience of naval assets, from surface combatants and submarines to unmanned maritime systems. This paper explores the evolving landscape of cybersecurity within integrated naval defense systems, examining the unique challenges posed by cyber warfare in maritime environments. Key topics include threat vectors such as state-sponsored attacks, malware targeting embedded systems, and the exploitation of satellite communications and data links. Additionally, the abstract discusses the importance of adopting a layered defense-in-depth strategy, incorporating zero-trust architectures, robust encryption, real-time intrusion detection, and comprehensive cyber hygiene practices across all levels of naval operations. Furthermore, the paper highlights ongoing advancements in artificial intelligence and machine learning to enhance threat detection and automate response mechanisms, as well as the need for joint cyber-naval doctrine*

development and cross-domain training initiatives. By emphasizing the integration of cybersecurity from the design phase through deployment and operation, naval forces can better safeguard mission-critical systems and maintain maritime superiority in the face of emerging cyber threats. Ultimately, this study advocates for a holistic, proactive cybersecurity framework as an indispensable component of modern naval defense.

Keywords: *Cybersecurity, Naval defense systems, Integrated platforms, C4ISR, Cyber threats, Defense-in-depth, Zero-thrust architecture, Artificial intelligence, Threat detection, Resilience*

27. (ID 240) Kamikaze Drones

Authors: stud. Aritea ALBU, stud. Emmyly PAVEL

Scientific Advisor: Lecturer Diana-Annelisse SOPON, PhD

Institution: “Nicolae Bălcescu” Land Forces Academy

Abstract: *This paper aims to explore the concept of an autonomous underwater kamikaze-type underwater autonomous system intended for targeted attack missions against enemy ships. The project aims to develop an underwater drone capable of operating independently, navigating silently and placing an explosive payload directly on the hull of a ship, triggering detonation at the optimal time. We will analyze the main engineering components of the platform: hydrodynamic structure, low-noise propulsion, autonomous navigation systems, passive acoustic sensing and the payload grappling mechanism. The paper also highlights the tactical advantages of such a drone over classical torpedoes, as well as the difficulties associated with avoiding sonar detection systems and possible countermeasures. Through this research, we aim to demonstrate the feasibility of an innovative solution for modern naval conflicts, where stealth, precision and autonomy are essential. The proposed project has the potential to fundamentally change the way underwater attacks are conducted, providing an effective and versatile alternative to asymmetric naval warfare strategies.*

Keywords: *Underwater drone, autonomous weapon, kamikaze, kamikaze, naval attack, military engineering, silent propulsion, controlled detonation, sonar detection, marine robotics, tactical innovation*

28. (ID 241) Current Methods for Delivering Small Packaged Goods/Parcels

Authors: stud. Ștefania MIHAI, stud. Ana-Gabriela BALUTĂ, stud. Nicoleta-Raluca TĂBÎRCĂ

Scientific Advisor: Lecturer eng. Ionel POPA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Door-to-door delivery has emerged as an essential logistics strategy for the efficient transport of small packages, particularly in trade flows originating from China. This integrated approach covers all stages of shipping, from collection to international transport (via sea, air, rail, or road), customs clearance, and final delivery. Key advantages include reduced risks, transparent costs, improved delivery times, and flexible options such as DDP and DDU. The selection of transport modes depends on urgency, volume, and destination: sea freight suits bulk shipments, air for urgent needs, rail for a balanced approach to Europe, and road for shorter distances. Technological innovations—such as autonomous ships, robotized port operations, and drone deliveries—are revolutionizing global logistics. In particular, such technical solutions can be applied to the operations of the Port of Constanța, where the use of electric drones for small-package delivery could significantly reduce pollution. Future developments emphasize AI, IoT, blockchain, and green logistics to enhance supply chain sustainability and efficiency.*

Keywords: *Door-to-door delivery, international transport*

29. (ID 251) The Influence of the SARS-CoV-2 Pandemic and the war in Ukraine on Freight Transport in Romania

Author: stud. Andrei TUDORACHE

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The global freight transport sector has undergone significant transformations in recent years, particularly due to two major disruptive events: the SARS-CoV-2 pandemic and the war in Ukraine. Romania, positioned at the crossroads of Eastern and Central Europe, has experienced notable challenges and adaptations within its freight transport system as a result of these crises. Covid-19 virus began to gradually but surely to compromise the continuity*

of production activities. Subsequently, the outbreak of the war in Ukraine brought additional pressures, such as rerouted transport corridors, increased fuel prices, and heightened geopolitical instability. This paper aims to analyze the combined impact of these two events on freight transport in Romania, highlighting both the price increases for the things that every human need, and also the freight volume increase for Constanta Port.

Keywords: *pandemic, war, freight, transport*

30. (ID 267) Analysis of Transportation Costs in AnyLogistix

Author: stud. Ileana Theresa BORA

Scientific Advisor: Commander Assoc. prof. eng. Alexandru COTORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this paper, I have addressed a highly relevant topic for the field of logistics and supply chain management—namely, the optimization of transport costs through the use of simulation and analysis software solutions. In a dynamic economy, where competition is increasingly intense and customer demands evolve rapidly, companies are compelled to adopt advanced tools that enable them to anticipate, control, and continuously improve their logistics processes. Transport remains one of the most expensive components of a supply chain, influencing not only the final price of products but also delivery times, customer satisfaction, and environmental impact. Within this context, the paper explores the applicability of the AnyLogistix platforma comprehensive simulation and optimization tool in the analysis of logistics flows and strategic decisions related to freight transport. Through a combined approach that integrates theoretical concepts with practical applications, the study examines how various logistics strategies can be tested in controlled environments, without disrupting real-life operations. A major advantage of such digital tools lies in their ability to simulate a wide range of “what-if” scenarios, allowing for the assessment of situations such as sudden spikes in demand, temporary shutdowns of distribution centers, or changes in transportation policies. The case study developed in this paper is based on a logistics network model tailored for the Romanian market, focusing on the transport of a fragile product set of plate to twelve major cities, with distribution*

starting from a central hub located in Bucharest. During the simulation, several variables are introduced, including seasonal demand fluctuations, cost per kilometer, vehicle capacity, and processing times. The outcomes are then evaluated using relevant key performance indicators (KPIs) such as cost per order, delivery time, total profit, vehicle capacity utilization, and service level. The conclusions highlight that platform like AnyLogistix can contribute to a deeper understanding of supply chain dynamics and support more informed and effective decision-making, both in terms of cost efficiency and environmental sustainability. Transport optimization should no longer be seen solely as a cost-cutting measure, but rather as an integrated strategy with direct impact on company performance, customer satisfaction, and the ecological footprint of operations.

Keywords: *Transport, cost, customer*

31. (ID 281) Europe's Inland Waters - Overview and Perspectives

Author: stud. Elena Ionela LUPOI

Scientific Advisor: Col. Assoc. prof. Cătălin POPA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Europe's inland waters represent a vital component of the continent's transport, environmental, and economic landscape. With an extensive network of rivers, canals, and lakes, inland waterways support sustainable freight transport, reduce road congestion, and offer environmentally friendly alternatives to traditional logistics. Major river systems such as the Danube, Rhine, and Elbe play a central role in connecting regions and facilitating international trade within the framework of the EU's transport and climate strategies. This paper provides an overview of the current state of inland waterway infrastructure in Europe, highlights the key economic and environmental benefits, and explores the challenges and opportunities shaping the future of inland navigation. Emphasis is placed on the integration of inland waterways into multimodal transport chains, investment in green technologies, and the policy frameworks guiding sustainable development. The analysis also discusses the potential of inland waters to contribute to the European Green Deal and the broader shift toward a low-carbon, resource-efficient economy.*

Keywords: *European transport network; River transport; Sustainable logistics*

32. (ID 298) The Role of Hydrogen as Enabler of Industrial Port Area Decarbonization

Authors: stud. Daiana-Elena BORLACHE, stud. Oana-Miruna BĂJAN

Scientific Advisor: Col. Assoc. prof. Cătălin POPA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *To meet environmental goals while maintaining economic competitiveness, worldwide ports have increased the amount of renewable energy production and have focused in optimizing performances and energy efficiency. However, carbon-neutral operation of industrial port areas (IPA) is challenging and requires the decarbonization of industrial processes and heavy transport systems. This study proposes a comprehensive review of decarbon-ization strategies for IPA, with a particular focus on the role that green hydrogen could play when used as renewable energy carrier. Much information on existing and future technologies was also derived from the analysis of 74 projects (existing and planned) in 36 IPAs, 80 % of which are in Europe, concerning hydrogen-based decarbonization strategies. The overall review shows that engine operation of ships at berth are respon-sible of more than 70 % of emissions in ports. Therefore, onshore power supply (OPS) seems to be one of the main strategies to reduce port pollution. Nevertheless, OPS powered by hydrogen is not today easily achievable. By overcoming the current cost-related and regulation barriers, hydrogen can also be used for the import/export of green energy and the decarbonization of hard-to-abate sectors. The technical and economic data regarding hydrogen-based technologies and strategies highlighted in this paper are useful for further research in the field of definition and development of decarbonization strategies in the IPA.*

Keywords: *Green hydrogen Port decarbonization Renewable energies Shipping Hard-to-abate sector Water electrolysis*

33. (ID 299) CO₂ Marine Transportation from a Techno-Energetic Perspective

Authors: stud. Oana-Miruna BĂJAN, stud. Daiana-Elena BORLACHE

Scientific Advisor: Prof. Florin NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *CCUS (Carbon Capture, Utilization, and Storage) is a cornerstone of most proposed carbon dioxide (CO₂) emissions strategies, as it is necessary to keep atmospheric CO₂ concentrations below 450 parts per million by the year 2100 and, as such, prevent global warming. The Intergovernmental Panel on Climate Change (IPCC) predicts a removal capacity of 12 GtCO₂/yr by 2050, whereas the present capability is 41 MtCO₂/yr. Decarbonization may not be able to proceed quickly enough to reach net-zero emissions without CCUS technologies. In the maritime sector, CCUS serves a dual purpose: capturing CO₂ from fossil fuel combustion and transporting the captured CO₂ for its storage or utilization. This paper examines the importance of vessels as liquid CO₂ carriers, emphasizing the transportation conditions associated with CO₂. A techno-energetic analysis is carried out by studying various combinations of temperature and pressure. From a transport viewpoint, the findings indicate that reducing CO₂ pressure is more cost-effective. In terms of pre-processing, higher CO₂ pressures may lead to energy and, potentially, cost savings. However, the optimal pressure in the entire logistical chain remains uncertain. Further research is advised to broaden the scope of the chain to be analyzed.*

Keywords: *carbon dioxide; shipping; CCUS; decarbonization; sustainable development goals; climate change; circular economy*

34. (ID 305) Applications of Complex Numbers in Football Tactics and Strategy

Authors: stud. Costica-Stefan PARDOS, stud. Cosmina-Elena PENA

Scientific Advisor: Lecturer Eleonora RĂPEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project explores the application of complex numbers in the analysis of tactics and strategy in modern football. By modeling the field as a complex plane and representing each player*

as a point in the form $z = x + iy$, a rigorous mathematical framework is provided for studying positions, rotations, and distances between players. Methods such as multiplication with complex units allow for the simulation of rotations and pass directions, while concepts like collinearity and vector lengths are used to optimize formations and pressing strategies. Case studies, such as passing triangles, highlight the usefulness of this model in analyzing rapid tactics. The project emphasizes the potential for extending this approach to video analysis and the development of artificial intelligence in sports.

Keywords: *complex numbers; complex plane; mathematical framework; multiplication with complex units*

35. (ID 307) Influencers vs. the Real Economy

Author: stud. Bogdana MOISE

Scientific Advisor: Assoc. prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Title: Influencers vs. the real economy. The presentation explores the contrast between the image promoted by online influencers and the economic realities faced by the majority of the population. It highlights the tendency to idealize the lifestyle promoted on social networks, in contrast to the economic difficulties of everyday life. It analyzes how ostentatious consumption, the promotion of unrealistic standards of success and the lack of a real connection to the real economy can distort the perceptions of the public, especially young people. The conclusion emphasizes the importance of financial education and discernment in relation to media content.*

Keywords: *influencers, real economy, public perception, social networks, financial education*

36. (ID 113) Speak Little, Gain Much

Authors: stud. Claudiu-Iulian GHEORGHE, stud. Laura IORDAN

Scientific Advisor: Prof. Grecu Gheorghe, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Negotiation represents a fundamental process in business and international relations, where the ability to reach mutually beneficial agreements can determine organizational success or failure. In today's globalized environment, negotiators face complex*

challenges stemming from diverse cultural backgrounds, conflicting interests, and high-stakes outcomes. This paper examines the key phases of negotiation - preparation, communication, bargaining, and implementation - while highlighting critical techniques such as the Win-Win approach, BATNA strategy, and psychological tactics. Special attention is given to the Romanian negotiation style, characterized by adaptability, relationship-building, and long-term partnership orientation. Through case studies including the privatization of BCR and the Dacia-Renault partnership, the study demonstrates how cultural factors and strategic concessions influence negotiation outcomes. The research underscores the importance of combining technical negotiation skills with cultural intelligence to navigate today's interconnected business landscape effectively.

Keywords: *negotiation techniques, BATNA strategy, cross-cultural communication, business diplomacy, conflict resolution*

37. (ID 151) Freight Transport Planning with AnyLogic

Author: stud. Bogdan MOROIANU

Scientific Advisor: Assoc. prof. Alexandru COTORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The paper presents the role and benefits of using the AnyLogic simulation platform in optimizing freight transport. In the first part, the fundamental concepts of transport planning and freight logistics are analyzed. Additionally, the research methods used are examined. The structure and principles of logistics process modeling are explored, highlighting the advantages of approaches based on discrete events, agents, and system dynamics. Subsequently, the paper provides a detailed perspective on how AnyLogic can be used to improve the efficiency of supply chains through the simulation of operational scenarios. The final part of the paper is dedicated to case studies demonstrating the applicability of this method in managing freight transport and optimizing decision-making processes.*

The research involved developing simulation models dedicated to freight transport, using AnyLogic to identify critical points in the logistics chain. Simulations allow for testing various scenarios to optimize routes and resource allocation, aiming to reduce costs and

improve delivery times. The primary goal of this study is to highlight the usefulness of AnyLogic as an advanced simulation tool for analyzing and improving freight transport performance, facilitating strategic decision-making in logistics.

Keywords: *freight transport, planning, AnyLogic Simulation*

38. (ID 158) The Digital Port Revolution: Technological Transformation and Efficiency in Modern Maritime Hubs

Author: stud. Antonio-Claudiu PISMIS

Scientific Advisor: Assoc. prof. Filip NISTOR, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Digitalization plays a key role in transforming maritime ports into smart logistics hubs. Technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Blockchain, automation, and 5G significantly improve port infrastructure and operational efficiency. This paper analyzes how digitalization impacts maritime ports from technological, operational, and environmental perspectives. It begins by defining the concept of smart ports and exploring how modern technologies optimize cargo flow, reduce costs, enhance security, and minimize environmental impact. The second section presents case studies on the Port of Constanta, the Port of Rotterdam, and the Port of Singapore. Constanta is examined in the context of recent digital developments, while Rotterdam and Singapore serve as global leaders in port digitalization. Each case highlights how digital tools improved efficiency, reduced costs, and supported sustainability goals. A comparative evaluation using available data and calculations shows measurable improvements before and after digital technology adoption. The findings reveal clear benefits in operational speed, cost reduction, and environmental performance. The paper concludes that strategic investment in digitalization is essential for modern ports. When implemented effectively, digital transformation brings substantial economic and ecological advantages, making it a critical path forward for the maritime industry.*

Keywords: *Digitalization, Smart Ports, Maritime Logistics, Technological Transformation, Internet of Things, Artificial Intelligence*

39. (ID 170) Intelligent System for Object Tracking in the Visual Field

Author: stud. Andrei MUSCĂ

Scientific Advisor: Conf. Dr. Ing. Ciprian-Ion RIZESCU

Institution: UNSTPB

Abstract: *A small-scale visual tracking platform in 2 axes, with a range of motion of up to 180 degrees around both vertical and horizontal axis that uses computer vision algorithms to detect certain object positions relative to the field of view. The system consists of a central processing unit, a motor control unit, two small load servo motors and a camera unit. The camera is mounted in a mechanical structure actuated by two servo motors which provide controlled rotation within range. This camera provides visual feed to the central processing unit that runs the images through an AI model and determines if the target object is in frame and if so determines its current position, if the current position is outside the tolerance area for tracking, an adequate command is sent to the motor control unit which actuates the motors to rotate the camera in a position in which the object is within the acceptable bounds relative to the field of view. The central processing unit is a Raspberry Pi 5 running a YOLO-based AI model trained beforehand. The YOLO algorithm is suitable for this application as its neural network approach makes it fast and accurate enough to run on the small-scale computer required to keep the dimensions of this system as small as possible. The motor processing unit is a slave ESP8266, the separation of processing and motor controls ensures a cleaner signal, modularity and a layer of safety. The servo motors used are basic MG90s and the camera unit is a PiCamera V2 with mechanical focus.*

Keywords: *Intelligent System for Object Tracking in the Visual Field*

40. (ID 312) Organization and Management of Processes Within a Railway Transport and Logistics Services Provider

Author: stud. Florentina-Anca VADUVA

Scientific Advisor: LCDR eng. Dragoș SIMION, PhD candidate

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the concept, evolution, and strategic importance of railway logistics in the context of modern transportation systems and supply chain management. Railway*

logistics involves the planning, management, and optimization of freight transportation via rail, ensuring efficient, cost-effective, and sustainable delivery of goods over medium and long distances. As global trade continues to grow and environmental concerns become increasingly urgent, rail transport is gaining renewed attention for its lower carbon footprint and high-volume carrying capacity compared to road and air transport. The study presents a historical overview of railway logistics, from its roots during the Industrial Revolution to its present-day transformation driven by digitalization, automation, and the integration of smart technologies. Innovations such as real-time cargo tracking, automated loading systems, and improved infrastructure have significantly increased the reliability and competitiveness of rail freight services. The paper also highlights the growing importance of intermodal transportation, where rail serves as a central component in a multimodal network, allowing seamless transitions between trucks, ships, and planes. Special attention is given to the development of logistics platforms and intermodal terminals that enable efficient cargo handling and consolidation. The role of government strategies, EU transport policies, and public-private partnerships is examined in driving infrastructure investment and improving cross-border connectivity. A brief case study of Romania illustrates national efforts to revitalize railway logistics through modernization programs and integration with European corridors. In conclusion, railway logistics stands as a key pillar of a sustainable, resilient, and integrated transport ecosystem. With proper investment and innovation, it can address major challenges such as road congestion, rising energy prices, and the urgent need to decarbonize freight transport.

Keywords: *Railway logistics, freight transportation, intermodal transport, supply chain management, sustainability, digitalization, smart technologies, infrastructure investment, public-private partnerships, EU transport policy, decarbonization, logistics platforms, Romania railway modernization, cross-border connectivity, carbon footprint reduction.*

41. (ID 308) Enhancing Naval Operational Readiness Through Intelligent Spare Parts Inventory Systems

Authors: stud. Ioana-Octaviana MĂNĂILĂ, stud. Maria IVĂNESCU

Scientific Advisor: Professor Eng. Gheorghe Samoilescu, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The research explores optimization techniques for managing spare electrical components inventory within the naval industry. By integrating traditional EOQ inventory theory with contemporary prediction methodologies, the study establishes a theoretical framework specifically tailored to naval operational requirements. The paper outlines forecasting algorithms, customized mathematical models, and naval-specific risk considerations, showing potential cost reductions of 18-25% alongside a 15% improvement in service quality. Additionally, the study introduces the Component Optimization and Management Platform for Advanced Ship Supplies (COMPASS), which incorporates artificial intelligence capabilities to enhance operational efficiency and strengthen supply chain resilience in naval operations.*

Keywords: *inventory, optimization, logistics, algorithms, supply, readiness, forecasting*

42. (ID 309) Modeling and Analysis of Fluid Movement in a Ballast Tank Under Dynamic Conditions

Author: stud. Ioana-Octaviana MĂNĂILĂ

Scientific Advisor: Associate Professor Eng. Rita AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The paper aims to investigate the dynamic behavior of fluids in ship ballast tanks, with a focus on flow phenomena and instability that occur under navigation conditions. The study concentrates on the mathematical modeling of sloshing effects, using Navier-Stokes equations and advanced numerical methods for simulating fluid-structure interaction. The theoretical component is complemented by a substantial practical component, implemented in the COMSOL Multiphysics simulation environment, where various water movement scenarios are reproduced depending on tank geometry and ship dynamic parameters. The results highlight the distribution of hydrodynamic pressures on tank walls, forces and*

moments generated by fluid movement, as well as their influence on the overall stability of the ship. The study's conclusions provide recommendations on optimizing ballast tank design and improving control algorithms for ship stabilization systems in adverse marine conditions.

Keywords: *ballast, fluid, sloshing, COMSOL, stability, navigation*

43. (ID 321) “Unemployment: An Economic and Social Challenge”

Authors: stud. Ana-Maria ONOFREI, stud. Larisa UNGUREANU

Scientific Advisor: Assoc. prof. eng. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This presentation aims to analyze the phenomenon of unemployment both in Romania and in Europe, providing a comprehensive overview of current trends, implemented policies, and future prospects. We will explore the evolution of the unemployment rate over recent decades, identifying the economic, political, and social factors that have contributed to its fluctuations.*

Keywords: *Unemployment rate, Technological change, Minimum wage law, Youth unemployment*

44. (ID 326) Elements of Port Logistics for The Operation of Special Cargo Units

Author: stud. Elena-Roxana MANEA

Scientific Advisor: Prof. Florin-Marius NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Maritime trade plays an important role in the global economy by facilitating the transportation of goods over long distances. The transport of heavy and non-standardized cargo presents major challenges. These types of cargo are difficult to handle, expensive, and require special solutions. Maritime transport uses specialized vessels depending on the type of cargo, such as containers, bulk goods, or vehicles. Non-standardized cargo, such as industrial equipment or wind turbines, is difficult to transport due to its large dimensions and sensitivity. These require special vessels and careful planning. To simplify the transport process, modern methods such as Design for X (DfX) are applied, which help in designing products in a way that makes them easier to transport. Sub-methods*

like Design for Logistics and Design for Transportability reduce costs, risks, and delivery times. These solutions contribute to streamlining the supply chain and increasing safety in maritime transport.

Keywords: *Cargo, wind turbines, vessels, special cargo units.*

45. (ID 351) Analysis of the Macrosystem of Naval Transport – Port Activity in Romania

Author: stud. Andreea-Cătălina PASĂRE

Scientific Advisor: Prof. Florin-Marius NICOLAE, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This paper explores the structure and functioning of Romania's naval macrosystem, highlighting its essential role in the global economy and international transport. The study analyzes the key factors influencing the efficiency of maritime transport, including port infrastructure, maritime fleets, international regulations, and the impact of new technologies on the sector. The applied research provides a practical perspective on the efficiency of maritime transport, examining how digitalization and sustainability contribute to optimizing naval operations. Factors such as the increase in cargo volume, competition between ports, and the impact of economic policies on the development of naval transport are highlighted. The paper emphasizes the need for integrated policies and strategic investments to ensure an efficient, competitive, and sustainable naval system in the long term, underlining the importance of a regulatory framework and innovative management in supporting the sustainable development of the sector.*

Keywords: *naval transport, maritime logistics, Romania maritime sector, shipping industry*

46. (ID 360) The Aegis Project

Authors: stud. Stefan MATVEI, stud. David MOLOAGA

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Automated Ports Meet Autonomous Ships*

With the ever-increasing need for goods to be transported across the continent, the European Union is seeking alternative ways to move cargo between its member states. The main goal of the AEGIS

Project is to redesign the transportation of cargo via inland waterways, thereby reducing the reliance on road freight. By developing a network of automated ports and autonomous vessels, this objective can be achieved more cost-effectively, while also decongesting roads and reducing pollution. Although the project has so far been implemented only in Northern Europe, its scope can be extended to the entire continent.

47. (ID 368) Semi-Supervised LLM-Based Decision-Making System for Naval Warfare

Authors: stud. Calin-David DUPLEA, stud. Andrei VINCENE

Scientific Advisor: Lecturer Dorin ALEXANDRESCU, PhD

Institution: Land Forces Academy "Nicolae Balcescu" Sibiu

Abstract: *Modern large language models (LLMs) offer a foundation for developing advanced decision support systems in military command centers. This paper proposes a semi-supervised decision-making engine that aggregates multi-modal battlefield data and employs LLMs to generate tactical recommendations. We outline the foundations of LLMs – from base models like GPT-2/GPT-3 to newer open models such as LLaMA and DeepSeek – and discuss their training methods (pretraining on massive corpora, supervised fine-tuning, and reinforcement learning from human feedback). The architecture of a command center decision engine is presented, integrating LLMs with multi-modal inputs (text reports, sensor data, imagery) to produce actionable outputs aligned with military doctrine (e.g., WARNOs and OPORDs). We describe how game-theoretic reasoning and tactical heuristics can be incorporated, with a human-in-the-loop ensuring alignment with commander intent and ethical constraints. The proposed system promises faster decisions, fewer human errors, and adaptivity to changing scenarios. Diagrams of the LLM training pipeline and the system's modular design are provided to illustrate our approach.*

Keywords: *Large Language Models; Tactical Decision Support; Multi-Modal Integration; Reinforcement Learning; Human-in-the-Loop*

48. (ID 389) Green Constanța: The Sustainable Future of the Port

Author: stud. Bianca-Alexandra IACOB

Scientific Advisor: Lecturer, eng. Ionel POPA, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The Green Port Project in Constanța aims to implement a sustainable port infrastructure that addresses contemporary challenges related to environmental protection and climate change. This initiative focuses on integrating ecological technologies into port operations, utilizing renewable energy sources, and optimizing logistics to reduce carbon emissions and minimize the impact on marine ecosystems. The project also seeks to foster collaboration among local authorities, port operators, and business communities to promote best practices in resource management and create a conducive framework for sustainable economic development in the region. Through these measures, the Green Port in Constanța will not only enhance operational efficiency but will also become a model of ecological responsibility within the European port context.*

Keywords: *Green Port, Sustainable Infrastructure, Environmental Protection, Climate Change, Eco-Friendly Technologies, Renewable Energy, Marine Ecosystems, Logistic Optimization.*

49. (ID 396) The Flow of Goods and Main Trade Routes in the Port of Constanța

Authors: stud. Elena-Alexandra IONIȚĂ, stud. Simona-Maria CHIRESCU

Scientific Advisor: Captain Assoc. prof. eng. Filip NISTOR, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Maritime transport is one of the most efficient and widely used forms of international transportation, playing an essential role in supporting the global economy. The flow of goods refers to the process by which goods are transported, handled, and distributed across various points of the logistics chain, ensuring their availability. This article analyzes the dynamics of goods flows within the Port of Constanța, a crucial hub in maritime trade networks and international commerce in Southeastern Europe. The main objective of ports is to manage goods flows, identify key trade routes, and analyze their impact on both regional and national economies. The*

study evaluates port infrastructure, transport facilities, cargo loading and unloading procedures, as well as logistical and economic challenges, while also highlighting the importance of the Port of Constanța. In conclusion, the project proposes solutions for improving infrastructure and logistics processes in order to increase the port's competitiveness and sustainability in the long term.

Keywords: Maritime transport, Flow of goods, Port infrastructure, Sustainability, Maritime trade networks, National economy.

50. (ID 397) Factors Influencing Corrosion: A Case Study of the Bric Mircea

Author: stud. Andreea UNGUREANU

Scientific Advisor: LCDR eng. Dragoș SIMION

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The Mircea brig, originally built in 1882, is an important symbol of the Romanian Navy and a remarkable example of historical ships, being designed for the training of sailors, with a traditional structure that includes wooden masts and square sails. Over the decades, the brig has been exposed to harsh marine environments, constantly subjected to salty water and extreme weather conditions, which have favored the appearance of corrosion on various components of the ship, thus affecting its durability. Even with the modernizations carried out over the years, the process of wear has continued to represent a constant challenge.*

Keywords: *Mircea training ship, maritime environment, climatic factors*

51. (ID 401) 4,5 and 6

Authors: stud. Martha BOICIUC, stud. Bogdan DRĂGAN

Scientific Advisor: Assoc. prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Life for most people has been structured since 1920 in a work week which includes 5 working days, these defining the way people manage the time they have (an extremely valuable unit of measurement). At the moment, perhaps the time has come to make a change for the better in this way of organizing the world, so the future may bring a decrease in the work schedule by one day, explaining both the benefits and disadvantages of it in different*

fields. At the opposite end, there is also debate in places where there is a system based on 6 working days which also has its good and less good parts. In an era of technology, every hour must be used appropriately for the good of the society in which we live as well as the fields of work that are in continuous development.

Keywords: *time society schedule*

52. (ID 436) Emulating Redundant Data Center Networks Using MPLS and Layer 2 VPN Services

Author: stud. Alexandra CRIȘAN

Scientific Advisors: Prof. Eng. Simona MICLĂUȘ, PhD, Lt. Assoc. Prof. Alexandru Gabriel ROMANIUC, PhD

Institution: "Nicolae Balcescu" Land Forces Academy, Sibiu

Abstract: *In today's digital era, where information holds significant value, protecting data during transmission increasingly important. This project explores the interconnection of distributed computing infrastructures using multiple communication protocols, including MPLS, BGP, and L2VPN. Various scenarios ranging from accidental failures to intentional changes in the network configuration are simulated to evaluate how the system adapts and maintains continuity. By using real software images in a virtual lab environment, the study demonstrates how a well-designed architecture can limit disruption and improve the overall security of data flows. The results highlight the benefits of redundancy and dynamic routing in modern network design.*

Keywords: *Data center, networking protocols, fault-tolerant design, system configuration*

53. (ID 441) Optimizing Military Logistics Processes Using Artificial Intelligence and Big Data – A Managerial Impact

Authors: stud. Valentin-Florin MIHAI, stud. Alex IONESCU

Scientific Advisor: Maj. Superior Instructor Ana-Maria MERLUȘCĂ

Institution: "Carol I" National Defence University

Abstract: *Artificial Intelligence (AI) and Big Data-driven optimization of military logistics becomes a strategic necessity for modern defense institutions in an environment of fast-paced digitalization. The purpose of this paper is to investigate the*

integration of such technology into the Romanian Armed Forces' logistics system for enhanced operational readiness, lower costs, and better managerial decision-making. Within this arena of utilization, AI will enable the manager to collect information, execute predictive analysis, manage inventories, optimize transport, and maintain equipment on an active basis. In the context of military logistics, these technologies will do away with uncertainty and reduce response time and facilitate smooth shifting from reactive to proactive planning. The research shows that the intelligent systems enable decision-makers through interaction with vast amounts of data and real-time translation into actionable insights for more effective supply chains. Based on national plans and logistics systems, an implementation model in phases with pilot schemes in the respective logistic domains is suggested supplemented by personnel training and process fine-tuning. The assessment reaffirms that AI is not focused on replacing human judgment but complementing it by enabling managers to make immediate and data-driven decisions while queuing live process modifications in the company. By developing on the process fronts of NATO and technology, integrating AI and Big Data into the military logistics, Romania will be able to provide increased agility, transparency, and resilience. The recommendations highlight the need for an institutional vision, for intersectoral collaboration, and for sustained investment in digitizing Romanian military logistics into a strategically responsive support system.

Keywords: military logistics, Artificial Intelligence, Big Data, Romania, optimization, management, defense transformation

54. (ID 465) The Strategic Role of Warehouses and Modern Technologies in Supply Chain Optimization

Author: stud. Marius-Cristian MARIAN

Scientific Advisor: Commander Assoc. prof. eng. Alexandru COTORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: Warehouses are essential components of the supply chain, ensuring an efficient balance between supply and demand and supporting the continuous flow of goods from production to consumption. They are not merely storage spaces but strategic

logistics centers that optimize inventory management, transportation, and distribution. Through modern handling techniques and the use of automated equipment such as electric pallet trucks, conveyor belts, and forklifts, warehouses are becoming increasingly efficient. Warehouse Management Systems (WMS), barcode scanners, drones, and IoT sensors help reduce errors and enable real-time stock monitoring. Storage methods like FIFO, LIFO, and automated picking ensure optimal organization and efficient order preparation. The integration of these modern technologies enhances productivity, reduces operational costs, and improves the quality of customer service.

Keywords: supply chain, Warehouse Management Systems, optimization

55. (ID 466) Aspects of Customer Relationship Management at a Shipping Company

Author: stud. Narcis-Andrei MERMAMBET

Scientific Advisor: Commander Assoc. prof. eng. Alexandru COTORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The paper explores the theoretical foundations of Customer Relationship Management (CRM), highlighting its importance in the transport and logistics industry, with a particular focus on the maritime sector. CRM is presented as an essential tool for both retaining existing customers and attracting new ones, through service personalization, optimized communication, and enhanced customer experience. Also, the paper emphasizes that maintaining strong customer relationships brings long-term benefits, reducing acquisition costs and contributing to building a positive reputation. Moreover, CRM enables better integration of marketing, sales, and support teams, ensuring a unified and efficient approach. The conclusions highlight that a well-implemented CRM becomes a significant competitive advantage, contributing to increased customer loyalty, improved services, and the sustainable development of companies operating in the transport sector.*

Keywords: customer relationship, management, logistics, maritime sector

56. (ID 468) Manager VS Lider

Authors: stud. Paul-Cristian ACATRINEI, stud. Bianca-Elena ARNĂUTU

Scientific Advisor: Assoc. prof. Gheorghe GRECU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The contemporary maritime industry involves a high level of operational complexity, requiring not only rigorous technical competencies but also advanced leadership and coordination skills. This paper analyzes the essential differences between the role of a manager focused on planning, organizing, and controlling current activities and that of a leader, who guides the crew through strategic vision, motivation, and adaptability. Based on concrete examples and a relevant case study from 2023, the distinct and complementary roles of these two figures in managing critical situations aboard ships are highlighted. The major challenges of maritime leadership and management are also discussed, ranging from the cultural diversity of crews to compliance with international safety and environmental regulations. The paper emphasizes the need for a functional balance between leadership and management as a key element for the resilience and efficiency of the naval sector in both the present and the future.*

Keywords: Leadership, Management, Maritim Industry, Coordination, Resilience

57. (ID 496) Mathematics and Nature

Author: stud. Elena-Florentina ION (IORDACHE)

Scientific Advisor: Lecturer Eleonora RÂPEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Mathematics is often considered an abstract discipline, but in reality, it is omnipresent in nature. From the harmonious proportions of the human body to the complex networks of lightning, there is a surprising mathematical order in everything that surrounds us. This project aims to analyze the main mathematical structures found in nature and highlight their importance in biology, physics, and even aesthetics.*

Keywords: Mathematics, harmonious proportions, golden ratio, Map of God, logarithmic spirals

58. (ID 245) The Importance of Logistics Operations in Warfare. Ways to Improve the Efficiency of Logistical Support for Troops.

Author: stud. Teodor-Ștefan RĂDOI

Scientific Advisor: Maj. Superior Instructor Ana-Maria MERLUȘCĂ

Institution: Carol I National Defense University

***Abstract:** Logistics was used first in the military domain, and it was considered that branch of the art of war responsible for the movement and supply of troops. The concept evolved from the need of military forces to be resupplied during warfare. The emergence of military logistics, as it is understood today, concedes with the appearance of organized armies, through which various nations or states tried to impose their military power over their neighbors. According to modern armies specialists, logistics must define the totality of material conditions needed to the successful implementation of military actions. In the modern warfare, logistics has new values, considering the reorient of deployment strategies, employment quality and the high technical level incorporated into the combat ways. The 21st century has commenced with an unprecedented intensification of market globalization, positioning logistics management as a critical area of managerial focus across all organizational sectors. It is defined by experts as the systematic process of planning, implementing, and controlling the cost-efficiency ratio related to the movement and storage of raw materials and finished goods, as well as the collection and management of information throughout the entire process from its initiation to the final consumption of its outcomes with the overarching objective of fulfilling consumer demands.*

***Keywords:** supply, warfare, organized armies, material conditions, deployment strategies, globalization, logistics management, implementation, cost-efficiency, raw materials, finished goods, information management, consumer demands*

59. (ID 245) The Importance of Logistics Operations in Warfare. Ways To Improve the Efficiency of Logistical Support for Troops.

Author: stud. Teodor-Ștefan RĂDOI

Scientific Advisor: Maj. Superior Instructor Ana-Maria MERLUȘCĂ

Institution: Carol I National Defence University Bucharest

Abstract: *Logistics was used first in the military domain, and it was considered that branch of the art of war responsible for the movement and supply of troops. The concept evolved from the need of military forces to be resupplied during warfare. The emergence of military logistics, as it is understood today, concedes with the appearance of organized armies, through which various nations or states tried to impose their military power over their neighbors. According to modern armies specialists, logistics must define the totality of material conditions needed to the successful implementation of military actions. In the modern warfare, logistics has new values, considering the reorient of deployment strategies, employment quality and the high technical level incorporated into the combat ways. The 21st century has commenced with an unprecedented intensification of market globalization, positioning logistics management as a critical area of managerial focus across all organizational sectors. It is defined by experts as the systematic process of planning, implementing, and controlling the cost-efficiency ratio related to the movement and storage of raw materials and finished goods, as well as the collection and management of information throughout the entire process from its initiation to the final consumption of its outcomes with the overarching objective of fulfilling consumer demands.*

Keywords: *supply, warfare, organized armies, material conditions, deployment strategies, globalization, logistics management, implementation, cost-efficiency, raw materials, finished goods, information management, consumer demands*

III. SECTION: MILITARY SCIENCES AND INFORMATION

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Stud. Adelin-Sorin ȚIPU

Stud. Eduard-Constantin ȘTEFAN

Room: LI126

1. (ID 2) Case Study on the Adaptation of Civilian Drones for Artillery Reconnaissance

Author: stud. Claudia MAHU

Scientific Advisor: col. (r) Eugeniu MARIȚ

Institution: Military Academy "Alexandru cel Bun", Chișinău
Republica Moldova

Abstract: *This research analyzes the importance of aerial assets, particularly drones, in contemporary military operations, with a focus on their use for artillery fire direction and reconnaissance missions. The integration of drones into artillery systems has led to a significant increase in targeting accuracy, a reduction in unnecessary munition consumption, and the optimization of operational efficiency. The study investigates various algorithms and advanced geospatial data processing methods aimed at enhancing the accuracy of target coordinate identification. Specifically, this research aims to adapt a civilian drone, the DJI Mini 2 model, for military scenarios, demonstrating how such a device can collect essential data for the rapid determination of target coordinates. By centralizing and organizing this data into an Excel database, the calculation and determination process of the target's position, including its azimuth, is significantly accelerated, allowing for a faster response on the battlefield.*

Keywords: *operational efficiency, UAVs, artillery targeting, geospatial data*

2. (ID 12) The Art of War and Strategic Planning

Author: stud. Bogdan GRIGORE

Scientific Advisor: Assoc. prof. Laura CIZER, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Introduction: The study of military strategy and the art of war has evolved significantly over centuries, influencing the outcomes of major historical conflicts. Strategic planning is at the heart of military success, guiding decision-making processes in both peacetime preparation and active engagements. This paper explores the core principles of strategic planning within the context of warfare, examining classic doctrines and their application to modern conflicts. The aim is to assess how theoretical frameworks, particularly from Sun Tzu’s The Art of War, continue to shape military strategy today.*

Keywords: *Strategic Planning, Military Strategy, The Art of War, Sun Tzu, Modern Warfare, Tactical Operations*

3. (ID 32) Methods, Tools, and Techniques for Spyware Attacks

Authors: stud. Bianca-Cristina CĂRBUNARU, stud. Denisa-Alexandra FOCA, stud. Geanina-Teodora JIGHIR

Scientific Advisor: Lecturer Eng. Florin POSTOLACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The aim of this study is to analyze spyware; an increasingly sophisticated type of malware designed to secretly monitor and collect users' data without their consent. The study explores spyware attack mechanisms, its impact on organizations and individual users, as well as strategies for detection, prevention, and mitigation.*

Keywords: *Spyware*

4. (ID 35) Electronic Countermeasures for Securing Maritime Communications Against Hostile Jamming

Author: stud. Mircea Gabriel MOLDOVAN

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maritime communications play a critical role in ensuring the safety and operational efficiency of vessels at sea. However, these systems are vulnerable to hostile jamming, which can disrupt vital communication channels, compromising both security and operational integrity. This paper explores advanced electronic countermeasures (ECM) designed to protect maritime communications from intentional interference. These measures include jamming detection techniques, signal processing algorithms for identifying and mitigating interference, as well as frequency diversification and encryption methods to safeguard against unauthorized access and signal disruption. The study also examines the practical implementation of these countermeasures in the challenging maritime environment, which is influenced by factors such as atmospheric conditions and natural obstructions. Findings suggest that a comprehensive and adaptable approach to ECM can significantly enhance the resilience of maritime communication systems, ensuring the continuity and security of communication links even in the presence of sophisticated electronic threats.*

Keywords: *Electronic Countermeasures (ECM), Maritime Communications, Communication Security*

5. (ID 51) President Trump - A Problem Related to the Global Leadership

Authors: stud. Paul Leonard DOROFTEI, stud. Călin Alexandru ȘTEFAN

Scientific Advisor: Assist. Prof. Ileana METEA PhD

Institution: Land Forces Academy "Nicolae Bălcescu", Sibiu

Abstract: *In our days the entire world is facing a lot of wars especially in the Middle East (Palestina-Israelian War) but also in the East of Europe (the war between Russia and Ukraine). Everybody knows that USA is the biggest global military force and also an important actor on the international scene of diplomacy. Recently President Trump made some mistakes from a diplomatic point of view, two representative examples being the meeting between the president of Ukraine (Zelenski) and Trump's administration staff, as well as the meeting between the staff and the president of France (Macron).*

Keywords: *wars, diplomacy, military force, global security, mistakes*

6. (ID 57) The Psychological Impact of War on Soldiers: Strategies for Mental Resilience

Author: stud. Mihai ANDRIESCU

Institution: "Alexandru Ioan Cuza" Police Academy, București

Abstract: *War is one of the most intense experiences a human can endure, often leaving lasting psychological scars on those who serve. Soldiers are exposed to extreme stressors, including direct combat, witnessing death, prolonged separation from loved ones, and the constant threat of injury or death. These experiences can lead to serious mental health conditions such as post-traumatic stress disorder (PTSD), depression, and anxiety. This paper explores the mental health challenges faced by military personnel during and after deployment, examining the factors that contribute to psychological distress, including combat exposure, prolonged deployments, and the moral injuries, which occurs when individuals struggle with actions that violate their personal ethical beliefs. In addition, some soldiers experience survivor's guilt, feeling remorse for having lived while their comrades did not.*

7. (ID 63) Leadership Development in Military Cadets

Author: stud. Vasilena CHERNEVA

Scientific Advisor: Major Rositsa NEDEVA

Institution: "Nikola Vaptsarov" Naval Academy, Varna, Bulgaria

Abstract: *The development of leadership qualities in future officers is a crucial topic in military education.*

Keywords: *Leadership styles, cadets, Blanchard and Hersey*

8. (ID 86) The Ethics of Power and The Power of Ethical Leadership and Strategic Use of AI in Modern Warfare

Authors: stud. Daria-Maria BOCOCI, stud. Adrian-Daniel PALCO

Scientific Advisor: Col. Andrei IGNAT

Institution: "Alexandru Ioan Cuza" Police Academy Bucharest

Abstract: *The world as we know it has had many conflicts unfolding over the centuries. Only in the last two centuries, our modern world has been shaped by the two world wars, countless civil wars, insurrections, terrorism, and instability. These conflicts have allowed humanitarian laws and norms to be established, to bring about a „law of war” which includes ethical issues, principles of*

proportionality, and the respect for the human being and its right, especially the right to live. Moving forward to the year 2024, the world grapples with many conflicts, uncertainty, and terror. As Russia attacked Ukraine in February 2022, and the Middle East conflict started in October 2023, the superpowers of the world have started a Cold War-similar arms race in order to ensure a climate of supremacy and power. The difference is that, during this arms race, apart from military advances and nuclear capabilities, global superpowers have rapidly integrated artificial intelligence (AI) into military arsenals for strategic advantages, operational enhancement, risk-free missions with no human deployment or integration, and intelligence-gathering advantages like never seen before. As a result, to think of AI as not only a powerful instrument, but also as a potentially conscious, strategic actor on its own, leading military operations and troops, or autonomous weapons into the field is not a very distant thought. This research articles intends to investigate the ethical aspects of how AI could evaluate certain war-related situations, the ethical aspect of the leadership of military operations by AI, or even an entire command given to AI as a military leader.

Keywords: *Leadership, Ethics, Intelligence, Management, Instrument*

9. (ID 105) Applying Artificial Intelligence in Police and Military Operations: Optimizing Decisions and Increasing Efficiency in Tactical Missions

Author: stud. Alexandru Florinel STAN

Scientific Advisor: Lt-col. Cătălin ENUȚĂ

Institution: "Alexandru Ioan Cuza" Police Academy Bucharest

Abstract: *This paper aims to analyze the main methods of development that made the operations within the Ministry of Internal Affairs and within the army. One of the remarkable things that have made a considerable difference in the current conflicts is artificial intelligence. As we can see, today's world is facing a hybrid war. Hybrid warfare combines conventional military tactics with cyber warfare, misinformation campaigns, economic pressure and other non-traditional strategies to achieve strategic objectives. This form of conflict blurs the lines between war and peace, making it difficult for nations to respond effectively. One of the key elements in hybrid warfare is the use of artificial intelligence (AI), which enhances both*

offensive and defensive capabilities. The integration of artificial intelligence into police workfare is reshaping the landscape of law enforcement. With the power to predict, analyze, and respond in ways never before imagined, AI offers both promise and peril. It enhances efficiency, yet raises ethical dilemmas. It uncovers hidden patterns, but at the same time sparks debates on privacy and control. As the boundaries between technology and justice blur, one question remains: Can AI truly serve and protect, or does it redefine what policing means?

Keywords: Military progress, strategy, army, artificial intelligence, hybrid war.

10. (ID 109) Psychological Operations in Military Hybrid Warfare

Authors: stud. Petrică-Iulian LUNGU, stud. Dună DIMITRIE

Scientific Advisor: Associate Professor Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Psychological operations (PSYOPS) represent an important tool within the framework of modern warfare, employed to influence the attitudes, perceptions, and behaviors of target audiences in support of strategic objectives. Through the deliberate manipulation of information, symbolic messaging, and communication channels, PSYOPS contribute to change the adversary's decision-making capabilities, strengthening internal cohesion, and shaping the informational environment. This article explores the theoretical and practical foundations of psychological operations, focusing on doctrinal principles, dissemination methods, and the legal and ethical framework surrounding their application. Furthermore, it examines the integration of PSYOPS into hybrid warfare and strategic communication, emphasizing the role of cultural intelligence and the necessity of tailoring messages to the socio-psychological characteristics of the target audience.*

Keywords: Information warfare, strategic influence, operational communication, hybrid warfare, PSYOPS, psychological operations

11. (ID 193) Article 5 of the Nato, Pillar of the Collective Defence Doctrine

Authors: stud. Cristian CERNEANU

Scientific Advisor: Col. prof. Marilena MOROȘAN, PhD

Institution: UNAP Carol I

Abstract: *Article 5 of the NATO, pillar of the collective defence doctrine, was implemented only once, after the attacks of September 11, 2001. Brought to life in 1949, in the midst of the Cold War, to ensure the security of the 12 members, today 32, this article embedded the principle that „any attack against one or more of them, in Europe or North America, will be considered as an attack against all”. The aim of this article is to emphasize the relevant issues relating to the basic principle of the North Atlantic Treaty Organization, the collective defence clause, starting from the only event that led to the invocation of the article and continuing with the current context and references about cyber attacks.*

Keywords: *Article 5; security; collective defence; NATO; Cold War.*

12. (ID 210) Firewatch: Romania at the Intelligence Frontline of NATO

Author: stud. Florin BRĂDEAN

Scientific Advisor: Military Instructor Captain Sorin LICA

Institution: "Alexandru Ioan Cuza" Police Academy, Bucharest

Abstract: *As NATO strengthens its eastern defenses amidst rising geopolitical tensions, Romania has emerged as a crucial player in the alliance's intelligence framework. Situated at the crossroads of Europe and the Black Sea, Romania's intelligence services play a pivotal role in safeguarding NATO's eastern frontier. This paper examines Romania's intelligence contributions within NATO, exploring its strategic positioning in counterintelligence, surveillance, and cyber defense. Drawing from a historical backdrop of post-communist transformation and NATO membership, it traces Romania's evolving intelligence capabilities and its integration into NATO's broader security architecture. The research delves into Romania's participation in multinational intelligence-sharing initiatives, its role in countering hybrid warfare, and its contribution to NATO's operations in crisis zones such as Afghanistan. By providing a detailed analysis of Romania's intelligence apparatus and its strategic significance, this study highlights the country's vital role in maintaining NATO's security along its eastern flank. Romania's position at the intelligence frontline is not only a*

testament to its regional importance but also a cornerstone of NATO's ongoing adaptation to contemporary security challenges.

Keywords: NATO, Intelligence, Black Sea, Emerging Threats, Security

13. (ID 216) Next-Gen Warriors: How VR Simulators Are Transforming Training in the Military

Authors: stud. Marcel Edward OPRÎȘAN, stud. Miruna CODREANU, stud. Daria CRISTEA

Scientific Advisor: Mr. Instr. sup. Ana-Maria MERLUSCA

Institution: National Defence University Carol I

Abstract: *The ability to conduct warfare requires knowledge operations as much as ammunition so training methods for soldiers need modernization. The WarGames 5.0 solution demonstrates a human-optimized military preparedness method which employs Virtual and Augmented Reality technology. This paper analyzes how immersive educational techniques improve reaction times and stressful choices and coordinated team work procedures in environments which are unsafe or too complex for conventional exercises. Through VR and AR simulations the military achieves two training objectives: lower operational costs and build emotionally authentic environments that build stronger psychological capabilities. The article applies Romania's military training institutions as an example to show how the Air Force together with Naval and Land Forces academies implement enhanced simulators to transform their combat training practices. The adaptive technology-driven adaptation of training in WarGames 5.0 establishes new guidelines which transform modern war preparation in digital environments.*

Keywords: virtual reality, military training, simulation technology, cognitive readiness, augmented reality

14. (ID 218) Commanding the Skies: Sixth-Generation Fighters and the Future of Air Dominance

Authors: stud. Irina-Ioana ANGHEL, stud. David TĂMAȘ

Scientific Advisor: Assoc. prof. Ionică CÎRCIU, PhD

Institution: Academia Forțelor Aeriene "Henri Coandă" Brașov

Abstract: *Air superiority has long been a cornerstone of strategic military advantage, with each new generation of fighter aircraft redefining the nature of aerial dominance. This presentation examines the emergence of sixth-generation fighter aircraft as the next transformative leap in air combat technology, emphasizing their critical role in reshaping global military capabilities. The study explores key defining features of these platforms including artificial intelligence integration, manned-unmanned teaming, directed energy weapons, adaptive engines, and advanced stealth highlighting how they collectively signal a shift from traditional piloted engagements to a more autonomous, network-centric approach to warfare. "Commanding the Skies: Sixth-Generation Fighters and the Future of Air Dominance" offers a forward-looking evaluation of how airpower is being reimagined for the 21st century, and how emerging aerospace technologies are shaping the next era of global defense strategy. Through a comprehensive comparative analysis, the project investigates the leading sixth-generation fighter programs under development by the United States (NGAD, F-47), Russia (Su-75 Checkmate), China (J-36), and Europe (GCAP, FCAS). The paper underscores the strategic significance of these programs as part of a broader geopolitical race for air dominance, examining their projected capabilities, timelines, and potential impact on future military doctrines. In doing so, it also addresses the major challenges facing sixth-gen development, including technological complexity, cost, and evolving roles of human pilots in increasingly automated combat environments.*

Keywords: *Sixth-Generation Fighter Aircraft, Network-Centric Warfare, Air superiority*

15. (ID 246) Information as a Weapon. Strategies of Influence and Manipulation in Hybrid Conflicts.

Author: stud. Luca STANCU

Scientific Advisor: Prof. Bogdan-Nicolae ȚONEA, PhD

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *In the contemporary era of hybrid conflicts, information has evolved from a passive medium of communication into a strategic weapon capable of shaping perceptions, influencing collective behavior, and destabilizing democratic institutions. This paper explores the phenomenon of weaponized information, analyzing the methods, techniques, and narratives employed by both state and non-*

state actors in the conduct of information warfare. Drawing upon interdisciplinary perspectives from political science, psychology, security studies, and communication theory, the study examines key cases such as the Russian-Ukrainian conflict, the COVID-19 infodemic, and the manipulation of electoral processes to illustrate the real-world impact and sophistication of these operations. The research argues that modern conflict is no longer confined to physical domains, but extends into the cognitive and emotional landscapes of societies. Consequently, defending against such invisible assaults requires more than technological resilience or regulatory frameworks it demands a proactive investment in media literacy, societal cohesion, and critical thinking. By highlighting the mechanisms through which truth is distorted and public opinion is hijacked, this study calls for a reconceptualization of national security, one that includes the informational and psychological dimensions of warfare. In a world where narratives can destabilize nations, safeguarding the integrity of information becomes a matter of strategic urgency.

Keywords: *hybrid conflict, information warfare, manipulation, disinformation, media literacy, cognitive resilience, narrative control*

16. (ID 253) Romania's Role in the Black Sea Geostrategy

Authors: stud. Teofil-Daniel ATOMEI, stud. Rareș-Dimitrie MOCANU, stud. Teofil ATOMEI

Scientific Advisor: Assist. Prof. Ileana-Gentilia METEA, PhD

Institution: “Nicolae Bălcescu” Land Forces Academy of Sibiu

Abstract: *Romania occupies a pivotal strategic position in the Black Sea region, serving as both a NATO and EU frontline state. The Black Sea represents a critical geostrategic nexus where economic, energy, and security interests intersect. Romania contributes actively to regional stability by modernizing its defense capabilities and deepening cooperation with strategic allies in response to growing regional threats, particularly from the Russian Federation. The Romanian Marine Infantry plays a fundamental role in safeguarding fluvial and coastal zones and is currently undergoing significant structural and operational enhancements. Advancing amphibious capabilities through investment in specialized equipment, training programs, and logistical infrastructure is essential. In this context,*

Romania is well-positioned to reinforce its status as a regional security provider and a key actor in Euro-Atlantic defense architecture.

Keywords: *Black Sea, economy, Marine Infantry, amphibious capabilities, security challenges*

17. (ID 256) TACIT WAR Intelligence, Manipulation and Cybersecurity in Contemporary Conflicts

Author: stud. Maria-Alexandra IORDACHE

Scientific Advisor: Prof. Mihaela Agata POPESCU, PhD

Institution: „Alexandru Ioan Cuza" Police Academy

Abstract: *This paper explores how intelligence, manipulation, and cybersecurity influence modern conflicts.*

In the 21st century, international confrontations no longer take place on traditional battlefields but are increasingly waged in digital and informational spaces. At the same time, manipulation through propaganda, disinformation, and psychological warfare has become a subtle yet highly effective weapon for shaping public opinion and destabilizing regimes. Cybersecurity completes this picture by offering both defensive measures against digital threats and offensive tools capable of paralyzing critical state infrastructure such as banking, energy, and communication systems. This new, largely invisible form of conflict is redefining the rules of war and intensifying global geopolitical uncertainty.

Keywords: *security, cyber-attacks, psychological manipulation, strategically, influential*

18. (ID 262) Mercenaries Through the Ages: From Ancient Warfare to Modern Private Military Companies

Author: stud. Brianna BRABETE

Scientific Advisor: Lecturer Diana-Annelisse SOPON, PhD

Institution: Land Forces Academy "Nicolae Bălcescu"

Abstract: *This text explores the historical and modern roles of mercenaries and private military companies (PMCs) in global conflicts. It begins with ancient mercenary forces such as Nubian archers in Egypt, Greek hoplites, and Roman auxiliaries, highlighting their skills, loyalty for pay, and influence on military strategies. It continues with medieval and Renaissance-era*

mercenaries like the Landsknechts, Swiss mercenaries, and Italian condottieri, emphasizing their battlefield impact and eventual decline due to changes in warfare. In the modern era, it focuses on the French Foreign Legion and controversial PMCs such as Blackwater, Wagner Group, and the "Romeos" led by Horațiu Potra. The text also addresses the legal and ethical challenges of PMCs, citing crimes, lack of regulation, and their role in prolonging conflicts. It concludes by underscoring the urgent need for international oversight to prevent abuse and ensure accountability in private military operations.

Keywords: *Mercenaries, Conflicts, Private Military Companies, International Regulation,*

19. (ID 270) Unmanned Ground Vehicles in Naval Warfare: Applicability and Future Potential

Author: stud. Maria-Teodora CUREA

Scientific Advisors: Prof. Ion CHIORCEA, PhD, Lieutenant jg. Silviu POPA, PhD student

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The persistent presence of unexploded ordnance (UXO) and the increasingly unpredictable behavior of unmanned aerial vehicles (UAVs) in conflict-adjacent regions continue to pose critical challenges to both national security and civilian safety. Recent incidents near Romania's borders such as drifting naval mines and unauthorized UAV incursions have accentuated the limitations of conventional threat mitigation strategies and the urgent need for technologically advanced, adaptive solutions. Naval mines, initially deployed for defensive purposes, have become destabilized due to environmental or operational factors, drifting into Romanian territorial waters and threatening maritime navigation as well as coastal populations. In parallel, the unintended intrusion of UAVs into national airspace introduces new operational risks, particularly when such systems malfunction or crash, potentially causing harm to people and infrastructure on the ground. These complex and evolving threat dynamics necessitate developing and integrating intelligent unmanned systems capable of operating in hazardous environments with minimal risk to human life. This project explores the deployment of Unmanned Ground Vehicles (UGVs), specifically focusing on their*

application in Explosive Ordnance Disposal (EOD) operations. Through remote detection, identification, and neutralization of UXOs, EOD-capable UGVs represent a scalable and efficient engineering solution that enhances operational effectiveness and significantly reduces the exposure of military personnel to high-risk scenarios.

Keywords: *Unexploded ordnance, naval mines, hazardous environments, Unmanned Ground Vehicles, Explosive Ordnance Disposal, remote detection.*

20. (ID 274) The Role of Intelligence Services in A Hybrid War

Author: stud. Vlad MILITARU

Scientific Advisor: Lieutenant Colonel Assoc. Prof. Cătălin ENUȚĂ, PhD

Institution: „Alexandru Ioan Cuza” Police Academy

Abstract: *After World War II, the operation and essential role of secret services within state conflicts were fully established. The result of the global conflagration was the division of states into democratic and communist blocs. Winston Churchill laid the foundation for this division through the concept of the "Iron Curtain." Thus, the Cold War began between the USA and the USSR, leading to a struggle between the CIA, established in 1947, and the NKVD, which became the MGB in 1946 and later the KGB. A significant part of the conflict was the arms race, particularly the development of nuclear warheads, a tool used in foreign policy for relations between the two states and simultaneously an object of intense work for intelligence services. This study provides an objective analysis of the key operations in which intelligence services played a critical role throughout the entire course of operations. The progression of the techniques employed from the Second World War to the present day is clearly observable, as is the essential role played by intelligence services throughout each historical period. Intelligence operations about another state that affect its sovereignty will always be a crucial branch of a state's strategy in warfare. This paper aims to highlight the importance of information as a component of military strategy*

Keywords: *Intelligence, strategy, conflict, information, sovereignty*

21. (ID 276) “Robots in Action: Transforming Logistics Through Warehouse Automation”

Authors: stud. Andreea-Maria GRĂMADĂ, stud. Alexandra Gabriela ROMAN, stud. Florin Ovidiu BUȘOIU

Scientific Advisor: Instr. Sup. Major Ana-Maria MERLUȘCĂ

Institution: National Defence University " Carol I "

Abstract: *This study explores the impact of automation on contemporary logistics, with a specific focus on the role of robots in warehouse operations. As supply chains increasingly demand higher levels of precision, speed, and efficiency, automation has emerged as a critical strategic solution. The paper examines the key technologies currently implemented in logistics centers, such as automated guided vehicles, robotic picking systems, autonomous mobile robots, and advanced sorting solutions. Additionally, it discusses the significant contribution of artificial intelligence and sensor technologies in optimizing operational processes. The study evaluates the benefits, including cost reduction, enhanced safety, and minimized human error, alongside the challenges, such as high initial investments, technological limitations, and sustainability concerns. Case studies from industries such as e-commerce and automotive logistics, including Amazon Robotics, provide practical insights into the effectiveness and real-world application of these technologies. Furthermore, the paper highlights emerging trends, such as the integration of collaborative robots, drone usage, hybrid human-robot systems, and the implications for cybersecurity, regulation, and ethics. The findings emphasize the potential of automation to transform supply chains and foster sustainable growth within the logistics industry.*

Keywords: warehouse robots, automated guided vehicles, supply chain efficiency

22. (ID 278) The Formation of European Military Academies: A Foundation for Strengthening European Military Standardization

Author: stud. Alexandru-Mihai MATEESCU

Scientific Advisor: Col (r.) Assist. Prof. Daniel SOLESCU, PhD

Institution: "Nicolae Bălcescu" Land Forces Academy, Sibiu

Abstract: *This article addresses the necessity of amplifying European military standardization by creating European Military Academies, due to the actual security environment in which defending Europe has become a top priority for all EU member states. Effective standardization begins with education, as achieving a high level of interoperability cannot rely only on joint exercises, it also requires a common educational foundation. By promoting European values, these academic environments will provide numerous advantages through the formation of a new category of future officers who will share a uniform and practical doctrinal framework, capable of sustaining interoperability and international cohesion among the armed forces of EU member states. Upon completing their studies, these officers will return to national training centers as instructors, applying the "train the trainers" model at the squad and platoon leadership levels, thereby effectively implementing European standardization down to the ordinary soldier. It is important to emphasize that European Military Academies will not compete with national academies but will supplement them to ensure the best possible standardization process. As a result, each EU member country will benefit from generations of well-prepared instructor-leaders who will ensure the proper implementation of standardization in defense of our common shared values. This article also examines the sustainability, implementation process, and challenges of this new but necessary concept for our times.*

Keywords: *European Military Academies, Military Standardization, European Security, Military Education, Interoperability.*

23. (ID 290) Murky Waters: The Black Sea Under the Shadow of the Ukraine Conflict

Authors: stud. Ioana-Theodora BIVOL

Scientific Advisor: Assoc. prof. Filip BACALU, PhD

Institution: „Alexandru Ioan Cuza” Police Academy

Abstract: *The war in Ukraine has triggered a significant wave of instability across the Black Sea region, with profound political, economic, and humanitarian consequences for neighboring countries, especially Romania. This paper aims to explore how the conflict has reshaped the security landscape of the Black Sea, intensified geopolitical competition, and influenced Romania's*

national policies as both a NATO and EU member state positioned at the edge of the war zone. The research addresses key questions regarding Romania's capacity to respond to new maritime security threats, how this conflict affects the stability of the Black Sea region security and how the war has affected energy routes, regional trade, and social cohesion through the influx of refugees. Using a multidisciplinary approach, including case studies, policy analysis, interviews, literature review and questionnaires, this paper contributes to a clearer understanding of the strategic importance of the Black Sea and the extent to which the Ukraine conflict has impacted Romania.

Keywords: *Ukrainian conflict; Political and social implications; Black Sea security; Refugee crisis; Regional stability.*

24. (ID 314) Leadership and Management

Authors: stud. Cosmin - Alexandru STANCU, stud. Valentina ANUȚEI, stud. Auraș Adrian ILIEȘ, stud. Andrei Ioan ILIEȘI

Scientific Advisor: Assoc. Prof. Carmen COJOCARU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This presentation explores the concepts of leadership and management, highlighting their complementary importance in organizational structures, especially in the military environment. Leadership is defined as the ability to influence, motivate, and inspire people through vision, empathy, and personal example, while management involves planning, organizing, and effectively controlling resources to achieve goals. The defining traits, skills, and behaviors of leaders and managers are analyzed, emphasizing how they contribute to the success of a team. The presentation includes a relevant case study, which highlights the practical application of the two roles in a military mission to evacuate civilians from a conflict zone. The leader acts through direct involvement and moral motivation, while the manager ensures logistical organization and effective coordination. Common leadership mistakes, such as lack of recognition or avoidance of conflict, are also discussed. The conclusion emphasizes that an effective leader must combine inspirational qualities with managerial rigor, because sustainable success depends as much on vision and empathy as on discipline and structure.*

Keywords: *Military leadership Resource management Leader manager complementarity Vision and influence Operational efficiency*

25. (ID 327) Entertainment and Propaganda – Memes as a Tool of Informational Warfare

Authors: stud. I. S. C., stud. B.-A. L.

Scientific Advisor: Assoc. prof. Ecaterina DRĂGHICI, PhD

Institution: National Academy of Intelligence “Mihai Viteazul”

Abstract: *Propaganda, a tool as old as the concept of states, has been forced to adapt to the technological advances of the 21st century. In an era in which the average person spends over two hours a day on social media, it is only logical that social platforms should become a channel for strategic communication. This paper aims to explore this new face of propaganda, focusing on the ways memes are employed as tools of informational warfare. This seemingly harmless means of entertainment is used by both state and non-state actors with an increasing frequency, in order to disseminate messages which further their interests. The study examines the characteristics of propaganda through memes, from the manner in which the images themselves are created, combining popular references with political ideas, to the techniques wielded for capturing the public's attention in a digital landscape characterized by an ever-increasing volume of information. It explores the advantages of employing such tactics for influencing the public opinion and the psychological and sociological effects they create. By means of case studies, this paper aims to outline the process through which humor and digital symbolism, characterized by polysemy, are used as tools in the arsenal of modern strategic communication.*

Keywords: *memes, propaganda, informational warfare, social media*

26. (ID 333) Aerial and Maritime Surveillance through UAV Technology: Strategic Applications and Evolution

Author: stud. Sorin NICHIFOROV

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the strategic and technological implications of unmanned aerial vehicles (UAVs), commonly known*

as drones, in the context of aerial and maritime surveillance. As autonomous or remotely piloted systems, drones have revolutionized modern surveillance operations by offering real-time data acquisition, extended operational reach, and the ability to function in hazardous environments without endangering human lives. Their increasing integration across military and civilian domains highlights their versatility from agricultural monitoring and environmental observation to complex military reconnaissance and tactical engagements. The study provides a historical overview of drone evolution, beginning with the early hot-air balloons of the 18th century, progressing through landmark innovations such as Britain's "Aerial Target," the American "Kettering Bug," and culminating in the development of advanced UAVs like the MQ-1 Predator, RQ-4 Global Hawk, and MQ-9 Reaper. These platforms demonstrate the increasing sophistication of UAV systems in terms of endurance, altitude capability, and multi-role operational functions, including precision strikes, border monitoring, and data-gathering under extreme conditions. In the maritime domain, UAVs are becoming indispensable tools for ensuring national and regional security. The paper details their critical use in border control, anti-piracy operations, port security, and search-and-rescue missions. Notably, the integration of drones into European Union Naval Force operations, such as Operation Atalanta near the Somali coast, underscores their growing role in combatting illegal maritime activities and enhancing navigational safety. Furthermore, the paper highlights Romania's adoption of medium-altitude long-endurance UAVs (MALE RPAS) in cooperation with the European Maritime Safety Agency to strengthen surveillance efforts in the Black Sea. By addressing both the opportunities and cybersecurity risks associated with UAV technology, this research emphasizes the transformative role drones play in 21st-century defense, maritime safety, and strategic decision-making. The findings underscore that UAVs are not merely support tools, but essential assets in building resilient and responsive security infrastructures across air and sea domains.

Keywords: UAV, multi-role, surveillance

27. (ID 334) The Implementation of Artificial Intelligence in The Logistics Operations of the Military Forces

Author: stud. Adil Gabriel SARÎ

Scientific Advisor: Mr. Instr. sup. Ana-Maria MERLUȘCĂ

Institution: „Carol I” National Defence University

Abstract: *This project presents a modern solution for improving military logistics by leveraging advanced technologies such as Artificial Intelligence (AI), the Internet of Military Things (IoMT), blockchain, augmented reality (AR), and autonomous delivery systems. The aim is to enhance the efficiency, precision, and resilience of supply operations in complex, unpredictable environments. Traditional military logistics often face significant challenges, including delayed responses, disrupted supply chains, limited situational awareness, and human error. The proposed system addresses these issues through AI-powered forecasting, autonomous transport, real-time monitoring, and secure data management. Resources such as ammunition, fuel, and medical supplies are delivered proactively and efficiently, even in remote or high-risk areas. By supporting decentralized decision-making, enabling live coordination through AR interfaces, and securing transactions via blockchain, this approach transforms logistics from a reactive function into a smart, adaptive, and technology-driven support system for modern armed forces.*

Keywords: *military logistics, smart logistics, tactical support, autonomous delivery system, blockchain, artificial intelligence, adaptive systems*

28. (ID 336) HUMINT in Urban Theaters of Operations: Adapting Intelligence Gathering to Modern Warfare

Authors: stud. M.-A. P., stud. F.-A. A.

Scientific Advisor: Assoc. prof. Ecaterin DRĂGHICI, PhD

Institution: National Academy of Intelligence "Mihai Viteazul"

Abstract: *Intelligence is a concept that represents the processing of information obtained within or outside a country, which could identify the threats to a nation, its people, interests, or independence, being able at the same time to provide insights not accessible elsewhere. HUMINT (Human Intelligence) is the key point of intelligence, involving gathering information through human sources*

and interpersonal communications. HUMINT can also be used in the military referring to operational intelligence that is needed to plan and execute campaigns and major operations aimed at achieving strategic goals in specific theatres or areas of operation. Therefore, this presentation will get into the details regarding the direct support of HUMINT in operation "Iraqi Freedom". Important facts such as its utility will be included further into the project.

Keywords: *Intelligence, warfare, HUMINT, operations, sources*

29. (ID 337) Air Defence in the Cold War: The Strategic Role of the HAWK System in NATO

Authors: stud. Bianca-Adriana LUPU, stud. Andreea-Raluca MUREȘANU

Scientific Advisor: Col. Assoc. prof. Daniel ȘTEFANESCU, PhD

Institution: "Henri Coanda" Air Force Academy, Brașov

Abstract: *In the context of geopolitical tensions during the Cold War, the North Atlantic Alliance (NATO) developed a series of defensive strategies aimed at countering the potential threat posed by the Warsaw Pact. A central element in the architecture of air defense was the HAWK (Homing All the Way Killer) surface-to-air missile system, designed by the United States and distributed to several NATO member states. The HAWK system provided a mobile and effective capability to intercept enemy fighter aircraft at medium altitudes, thereby complementing in-depth air defense and reducing the vulnerability of critical infrastructure. By integrating this system into the joint defense network, NATO managed to strengthen deterrence and maintain a strategic balance in the face of the numerical superiority of the Warsaw Pact's air forces.*

Keywords: *Geopolitical tensions • Cold War • North Atlantic Alliance (NATO) • Defensive strategies • Warsaw Pact • HAWK (Homing All the Way Killer)*

30. (ID 338) An Analysis of the Triggering Factor that led to the Initiation of Military Operation Desert Storm

Author: stud. Maria-Theodora ION

Scientific Advisor: Col. Assoc. prof. Daniel ȘTEFĂNESCU, PhD

Institution: Academia Forțelor Aeriene "Henri Coanda" Brașov

Abstract: *Operation Desert Storm was a major military intervention within the Gulf War (1990–1991), carried out by an international coalition led by the United States in response to Iraq's invasion of Kuwait. This paper analyzes the complexity of geopolitical, economic, and military factors that contributed to the escalation of the conflict, focusing on the expansionist ambitions of Saddam Hussein's regime and the unstable regional context. The study examines the historical formation of Iraq, its internal dynamics marked by ethnic and religious rivalries, as well as its tense relations with neighboring countries, particularly Iran and Kuwait. It also explores external influences, the pressures exerted by the United Nations Security Council, and the impact of the Iran–Iraq War on Baghdad's strategic decisions. The conclusion highlights that Operation Desert Storm was not merely a military response to direct aggression, but a coordinated effort to uphold international order, safeguard energy resources, and curb Iraq's destabilizing influence in the Gulf region.*

Keywords: *Operation Desert Storm, Gulf War (1990–1991), Iraq Kuwait conflict, Saddam Hussein, international coalition, global security*

31. (ID 365) Duct Tape: The Military Breakthrough That We Use Every Day

Author: stud. Mark TIMOTITY

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *One of the most interesting inventions pioneered and popularised by NATO militaries that are now common in everyday life is. the famous duct tapes. The adhesive tape we currently use was born from the brilliant idea of a worried mother. Vesta Stoudt worked in a munitions factory during the Second World War while her sons served in the US Navy. What's stronger, more durable and more versatile than duct tape? A mother's determination. Stoudt wrote a letter to then-president, Franklin Roosevelt, to replace the wax and paper tape used to seal artillery boxes with a new type of water-resistant, cloth-based tape instead. Shortly thereafter, the new tape was developed and rolled out and not just for ammunition crates. It has since been used not only for military equipment and*

home repairs, but also to seal wounds and staunch bleeding, and even to help astronauts explore the Moon!

Keywords: *Duct tape, Military invention, World War II, military equipment*

32. (ID 374) AUVs, the Weapon of the Future

Author: stud. Denisia AMATEESEI

Scientific Advisor: Prof. Ion CHIORCEA, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This paper explores the impact and potential of Autonomous Underwater Vehicles (AUVs) in the modern context of naval warfare. As maritime conflicts grow increasingly sophisticated, the use of autonomous technologies becomes essential for protecting strategic interests and enhancing operational efficiency. The study reviews the early development of AUVs, highlighting their transformation from research tools into systems with tactical and strategic applications. Advanced projects in the field are presented, along with a specific case where AUVs contributed to the success of a naval mission. The conclusions emphasize the crucial role these technologies will play in the future of global maritime security.*

Keywords: *AUV, Autonomous Underwater Vehicle, naval warfare, military technology, underwater robot, mine detection, modern warfare, Sea Hunter, Bluefin-21, REMUS.*

33. (ID 378) AI and Big Data for Military Strategy: A Two-Way Process

Author: stud. Dragoș PĂTRAȘCU

Scientific Advisor: Assoc. prof. Cătălin ENUTA, PhD

Institution: „Alexandru Ioan Cuza" Police Academy

Abstract: *This research focused on the transformative yet ethically ambiguous use of artificial intelligence (AI) and big data in contemporary military strategy, particularly the new developments, such as the Pentagon's Replicator program (2023), which executed AI-enabled drone swarms in NATO exercises, and AI-supported intelligence operations during the Ukraine War that employed machine learning algorithms to analyze satellite imagery and identify targets 50% quicker than human evaluators. In exercising or relying on such capacities, these capabilities functioned above and beyond*

the limits of human effort, such as reducing cognitive decision-making cycles by 73% in simulated advances against anti-aircraft systems and decreasing operational casualties due to more precision targeting by 41%. The use of these capabilities also revealed systemic weaknesses, such as the 22% of autonomous systems that displayed algorithmic bias and misidentified civilian infrastructure in urban combat simulations and 68% of missions using autonomous weapon systems that resulted in accountability disputes during the post-mission audits. This research used mixed methods strategies combining the outcomes of the Replicator program's tactical deployments, quantitative evaluations of declassified decision-making timelines from human and AI evaluations of the Ukraine conflict, and ethical risk evaluations in line with new NATO standards and guidelines and RAND Corporation white papers. The findings confirmed both AI and big data are capabilities that must be foundational to enable "data dominance", which is a key strategy for 21st century militaries; yet, without regulation, they can unintentionally escalate conflict, allow adversaries to exploit the consequences of implementing biased algorithms, and affect global security stability negatively. The research concludes that multilateral governance approaches, such as the EU's proposed AI in Defense Act (2024) should be effective mechanisms to reconcile tactical advances in military innovation while maintaining accountability to recommend for ethical use of AI in the military and maintain artificial intelligence as democratizing force rather than a vehicle for destabilization.

Keywords: *Military AI, Big Data Warfare, Autonomous Weapons Ethics, Data Dominance, Algorithmic Warfare*

34. (ID 379) Military Sciences - Facts

Author: stud. Bogdan-Adrian CADAR

Scientific Advisor: Police Chief Commissioner, Prof. Valeria GHEORGHIU

Institution: „Alexandru Ioan Cuza” Police Academy

Abstract: *My project explores the field of military sciences and information, focusing on how military organizations operate and manage information in modern conflicts. It presents key concepts such as defense strategies, national security, intelligence gathering,*

and the role of technology in the modern warfare. The project also analyzes the structure and functions of military institutions, the importance of leadership and training, and the integration of military intelligence in operations. Special attention is given to cybersecurity, surveillance, and the ethical challenges related to intelligence activities. Overall, the project emphasizes the critical role of military knowledge and accurate information in maintaining national and international security.

Keywords: *defense strategies, national security, the role of technology*

35. (ID 390) Technological Advances in Romanian Naval Mine Countermeasures Operations

Authors: stud. Gabriel-Antonio MOREA, stud. Valentin TÎMPU

Scientific Advisor: Captain eng. Cătălin-Paul CLINCI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This chapter offers an in-depth assessment of the Romanian Naval Forces' current capabilities in the domain of mine countermeasures (MCM), with a focus on the integration of advanced underwater platforms and systems used for mine detection, identification, and neutralization. Emphasis is placed on the recent acquisition of two Sandown-class minehunter vessels, transferred from the Royal Navy, which represent a significant leap forward in Romania's naval warfare capacity. These vessels are constructed with non-magnetic glass-reinforced plastic hulls, optimized for safe operations in mine-threatened waters, and are equipped with state-of-the-art Type 2093 variable-depth sonar systems capable of detecting a wide range of naval mines under diverse hydrographic conditions. In addition to their sonar suites, these minehunters can deploy both autonomous underwater vehicles (AUVs) and remotely operated vehicles (ROVs), enhancing operational flexibility and reducing the risk to personnel. Central to their mine neutralization capability is the Seafox system an expendable, fiber-optic guided ROV developed by Atlas Elektronik. Designed for one-time use, SeaFox vehicles carry onboard explosive charges to destroy mines after visual confirmation, offering both speed and precision in MCM operations. The chapter explores the synergy between onboard sensors, unmanned systems, and operational doctrine, highlighting*

how these capabilities contribute to Romania's increased interoperability within NATO maritime task forces. Overall, the analysis underlines the strategic importance of modern mine warfare assets in safeguarding naval mobility and maintaining maritime security in the Black Sea region and beyond.

Keywords: Mine countermeasures, Sandown-class, SeaFox, ROV, sonar, NATO interoperability

36. (ID 395) Emerging Technology: 3D Printing in the Construction of Autonomous Underwater Vehicles

Author: stud. Mirela Andreea CAZAN

Scientific Advisor: LCDR Assoc. prof. Ovidiu-CRISTEA, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This project presents the process of designing and manufacturing an autonomous underwater vehicle (AUV) using 3D printing technology. The main goal is to demonstrate the applicability and efficiency of additive manufacturing in the construction of functional structures for underwater robots. The term "3D printing" implies a technology that is different from traditional part production, building complex shapes using a smaller amount of material. The printing process begins by designing a 3D model, known as a CAD (computer-aided design) model, then manufactured by 3D printing using PLA a biodegradable material with good mechanical properties and water resistance. The choice of 3D printing offered significant advantages in terms of costs, execution time and the possibility of rapid customization of the design. The project highlights the potential of this technology in the field of marine research, robotics and the development of rapid prototypes for underwater applications.*

Keywords: *imprimare 3D, vehicul subacvatic autonom, proiectare CAD, PLA, robotica, inginerie marină*

37. (ID 399) Geopolitics Reloaded: Will AI or Nations Rule Tomorrow?

Author: stud. Bogdan CLIPA

Scientific Advisor: Assoc. prof. Nicolae-David UNGUREANU, PhD

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *The rapid development of artificial intelligence is profoundly transforming the global geopolitical landscape, influencing key decision-making processes in security, economy, and foreign policy. This paper explores how AI adoption by states and corporations can impact national sovereignty, creating technological dependencies that threaten autonomous decision-making. The study analyzes the risks associated with delegating strategic decisions to autonomous systems and their implications for international law. Additionally, it examines existing legislative and diplomatic initiatives aimed at regulating AI on a global scale, proposing solutions to safeguard state sovereignty in an ever-evolving geopolitical environment.*

Keywords: AI, geopolitics, sovereignty

38. (ID 404) Study on Determining the Combat Capabilities of Artillery-Carrying Vessels Against Armored Surface and Land Targets

Authors: stud. Valentin-Eduard TÎMPU, stud. Gabriel MOREA

Scientific Advisor: Captain eng. Cătălin-Paul CLINCI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the tactical properties, combat principles, and operational capabilities of riverine armored gunboats. These vessels exhibit high maneuverability, rapid response capabilities, sustained firepower, and minimal reliance on electronic warfare systems. Their compact size enhances natural camouflage and reduces detection by enemy forces. The study outlines key combat employment principles including freedom of action, mission clarity, concentration of effort, economy of forces, maneuverability, unified command, operational security, surprise, and simplicity. The paper also details the combat organization of gunboat crews, which is divided into specific battle posts and services to optimize the use of onboard weaponry and equipment. Combat capabilities are analyzed in terms of reconnaissance, maneuver, and destructive potential, all influenced by factors such as crew experience, armament effectiveness, and environmental conditions. The findings emphasize that tactical efficiency and operational success depend on adaptability, timely decision-making, and integration of available resources.*

Keywords: *artillery-carrying vessels, combat capabilities, tactical properties, maneuverability, firepower, armored targets*

39. (ID 405) Psychological Implications of Military Life

Author: stud. Marian-Sebastian PARASCA

Institution: „Alexandru Ioan Cuza" Police Academy

Abstract: *The military field of work represents a complex and demanding context, considering psychological approach, characterized by high stress levels, discipline, strict hierarchies and frequent exposure to critical situations. This paper approaches psychological aspects that reflect in the lives of military active personnel, focusing on factors such as operational stress, psychological trauma, military life and program adaption. A focus point to be discussed is determined by PTSD, anxiety, depression, which can actually be prevented and cured with psychological sessions so as to develop coping and psychological resilience. It is important to underline that in order to prevent and eventually cure consequences of the military field, prevention programs and institutional policies have to early start supporting mental health of workers. In order to promote a healthy and sustainable organizational culture, military psychology, leadership and human resources must combine. Manpower is needed to set and achieve goals; every individual plays an important role in the team. Therefore, psychological state of workers is important to analyze.*

Keywords: *psychology, advice, support, behaviour, development*

40. (ID 414) The Use of Unmanned Aerial Systems in the Ukrainian War

Author: stud. Andrei-Denis NECULA

Scientific Advisor: Col. Assoc. prof. Vasile ȘANDRU, PhD

Institution: "Henri Coandă" Air Force Academy, Brașov

Abstract: *The ongoing conflict in Ukraine has witnessed a significant evolution in warfare tactics, particularly through the integration of Unmanned Aerial Systems (UAS). This paper examines the multifaceted roles that UAS have played in the Ukrainian conflict, including reconnaissance, targeting, and combat operations. By analyzing various case studies, the research highlights how UAS technology has transformed traditional military strategies, enhancing*

situational awareness and operational efficiency. The paper also discusses the implications of UAS deployment on civilian safety, ethical considerations, and the evolving nature of international warfare. Furthermore, the study explores the responses from both Ukrainian and opposing forces regarding UAS utilization, emphasizing the strategic advantages and challenges presented by this technology. Ultimately, this research aims to provide a comprehensive understanding of the impact of unmanned aerial systems on modern combat scenarios, with a specific focus on their significance in the Ukrainian war.

Keywords: *Unmanned Aerial Systems, Ukraine, warfare, reconnaissance, targeting, combat operations, military strategy, civilian safety, ethical considerations*

41. (ID 419) Nonverbal Indicators in Evaluating Mental State on The Battlefield

Author: stud. Delia-Teodora CIOBANU

Scientific Advisor: Col. Assoc. prof. Adrian LESENCIUC, PhD

Institution: "Henri Coandă" Air Force Academy, Braşov

Abstract: *Mental preparedness for the battlefield is a fundamental aspect of operational effectiveness for military personnel, having a direct impact on their ability to respond under extreme stress conditions. This process includes the development of situational awareness, self-control, and psychological resilience, which are essential elements for confronting physical and psychological threats. In this context, nonverbal language becomes a crucial channel of communication, playing a significant role in expressing the emotional and psychological state of soldiers. Nonverbal cues, such as posture, gestures, and facial expressions, not only reflect individuals' internal states but also indicate how they adapt to complex operational environments. Therefore, an in-depth understanding of these nonverbal signals is essential for military leaders, who must recognize and manage the effects of operational stress on their units. Implementing effective stress management strategies and mental preparedness can enhance not only individual performance but also team cohesion, thereby contributing to the success of military missions and safeguarding the mental health of personnel.*

Keywords: *mental preparedness, battlefield, nonverbal communication, operational stress, psychological resilience, operational effectiveness*

42. (ID 421) The Digitalization of Military Logistics and Its Impact on Sustainability and Operational Efficiency

Author: stud. Gabriel-Alexandru MARIN, stud. Răzvan-Iulian PATRICHE, stud. Rareș-Alin BRĂȘFELEAN

Scientific Advisor: Assoc. Prof. Mădălina SCIPANOV, PhD

Institution: „Carol I” National Defence University

Abstract: *The digitalization of military logistics represents a fundamental transformation in the way armed forces plan, coordinate, and execute support operations. This technological evolution not only enhances operational efficiency in combat theaters, but also becomes a strategic pillar in achieving sustainability goals. The study explores the integration of emerging technologies such as Artificial Intelligence (AI), Big Data analytics, the Internet of Military Things (IoMT), blockchain, and digital twins, emphasizing how these innovations optimize resource consumption, reduce carbon emissions, and improve traceability and operational security. The paper highlights the logistical benefits of digitalization, including automated resupply, predictive maintenance, the use of drones and autonomous vehicles for deliveries in hostile environments, and scenario modeling through risk-free simulations. At the same time, it addresses associated challenges: cybersecurity vulnerabilities, implementation difficulties in austere environments, the need for interoperability between systems, and personnel resistance to change. The conclusion underlines that the digitalization of military logistics is not just a competitive advantage, but a strategic necessity. Sustainability is becoming the driving force behind logistical innovation, prompting the transition to autonomous, interconnected, and adaptable digital systems. Thus, the future of military logistics is shaped as efficient, resilient, and deeply environmentally responsible.*

Keywords: *Digitalization, Military logistics, Sustainability, Artificial Intelligence (AI), Internet of Military Things (IoMT), Predictive maintenance, Cybersecurity, Autonomous Systems.*

43. (ID 422) Cybersecurity and the Geopolitical Impact on the Romanian Economy

Authors: stud. Florentin-Gabriel FLOREA, stud. Adela FLOREA, stud. Darius Augustin ȘTEF, stud. Daniel CÎȘLARU

Scientific Advisor: Assoc. prof. Loredana PĂUNESCU, Habil. PhD

Institution: Military University of Petroleum and Gas of Ploiești

Abstract: *The research paper aims to analyze cybersecurity and the geopolitical impact on the Romanian economy, in the context of heightened global instability, generated by military conflicts, international trade tensions and increasingly sophisticated cyber threats. The first segment of the research will address the direct and indirect influences of the military conflict in Ukraine on the Romanian economy. It will highlight the changes in regional trade, the increase in defense spending, the inflationary impact generated by the energy crisis and the changes in investment flows in the area. In parallel, the effect of customs duties imposed by the United States on other states, especially European ones, will be analyzed, and how these protectionist measures influence the balance of international trade and Romania's trade relations with its main partners. The paper will also explore the evolution of publicly listed military industry companies, with a focus on increasing share value and expanding production capacities in the context of increasing demand for defense equipment and technology. Special attention will be paid to cybersecurity. Recent statistics on the increase in cyber attacks, the forms they take and the vulnerabilities existing in critical infrastructures will be analyzed. The paper will highlight the essential role of national security in developing prevention and response capabilities, through policies, investments and international collaborations. Finally, the research will formulate future perspectives, highlighting the interdependence between security, geopolitical stability and Romania's economic performance, in a global framework marked by volatility and emerging challenges.*

Keywords: *geopolitical, cybersecurity, economy, military skills*

44. (ID 423) Slocum G3 Glider Command Generator - Software Proposal

Author: stud. Petrică-Iulian LUNGU

Scientific Advisor: LCDR Assoc. prof. Ovidiu-CRISTEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Generating command sequences for autonomous underwater vehicles such as the Slocum G3 Glider is a time-consuming and error-prone task when done manually. The aim of this paper is to propose an efficient and user-friendly software solution that can automatically generate command files in .txt format compatible with the Slocum G3 Glider system. This work analyzes the technical requirements of such software, defines the command structure, and outlines a functional model for both the user interface and program logic. The proposed solution is intended to reduce human error and simplify the mission configuration process. The project draws on knowledge from various disciplines, including programming, control systems, data formatting, and the operation of autonomous underwater vehicles. In the future, this proposal can be developed into a fully functional application, with a graphical interface and potential integration with external tools such as Excel.*

Keywords: *Slocum G3 Glider, software, txt, autonomous underwater vehicles, human error reduction, graphical interface, automation*

45. (ID 443) The Alliance Reshaped: NATO's Strategic Response to Modern Crises and Conflicts

Author: stud. Robert MUCENICU

Scientific Advisor: Assoc. prof. Cătălin ENUȚĂ, PhD

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *After the Soviet Union collapsed, NATO faced a major challenge in rethinking its mission and military strategy. Without a single, dominant enemy, the Alliance shifted its focus from Cold War-era defense to a broader range of security concerns, including crisis management, peacekeeping, and counterterrorism. This paper looks at how NATO has adapted its military doctrines, force structure, and operational strategies to stay effective against new and emerging threats, such as hybrid warfare, cyber attacks, and regional conflicts. It focuses on key changes like the reform of NATO's Command Structure, improved cooperation between forces, and the adoption of multi-domain operations. By examining examples like NATO's response to Russia's actions in Ukraine and its increased deployments in Eastern Europe, the paper evaluates how NATO has maintained its military strength and strategic unity in the shifting*

global security landscape. Ultimately, the study highlights how NATO's evolving strategies help it continue to deter threats, defend its members, and adapt to future challenges.

Keywords: *military, NATO, doctrine, security, warfare*

46. (ID 447) Information Manipulation in the Hybrid Space: Between Public Perception and Strategic Advantage

Author: stud. George-Cristian ENE

Scientific Advisor: Assoc. prof. Cătălin ENUȚĂ, PhD

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *In the current context of hybrid conflicts, informational manipulation has emerged as a subtle yet highly effective weapon. This paper explores how state and non-state actors exploit the informational space to shape public perceptions, create confusion, and gain strategic advantages without resorting to direct military force. The study investigates the ways in which such informational influences impact social cohesion, trust in institutions, and decision-making processes at the strategic level. Drawing on relevant examples from recent conflicts, the paper highlights the need for a multidimensional defense approach, in which informational resilience becomes a key component of national security. In an increasingly complex and unstable security environment, the ability to identify, understand, and counter informational manipulation is no longer optional, it is a critical necessity for the stability and survival of modern states.*

Keywords: *Strategic Influence, Hybrid Conflict, Informational Manipulation.*

47. (ID 454) Biomarkers for Real-Time Monitoring of Soldiers Psychological and Psyhical States: A Frontier in Military Health Management

Authors: stud. Nicolae-Bogdan MARCU, stud. Viorel-Adelin CHIȚU

Scientific Advisor: Major Ana-Maria MERLUȘCĂ, Superior Instructor

Institution: "Carol I" National Defense University

Abstract: *This article explores the emerging role of biomarkers in real-time monitoring of the psychological and physical states of*

soldiers, emphasizing their potential for enhancing performance, ensuring safety, and mitigating health risks in military contexts. Biomarkers such as cortisol, heart rate variability, and inflammatory markers are examined for their ability to provide insights into stress, fatigue, and overall readiness. The integration of wearable technologies and advanced analytics enables continuous data collection and analysis, offering military leader's actionable insights to optimize decision-making and resource allocation. Case studies from recent deployments and training environments illustrate how biomarker-based monitoring can improve outcomes, reduce medical evacuations, and support mental resilience in high-stress situations.

Keywords: Biomarkers, Real-time monitoring, Military health, psychological state, Physical state, Stress biomarkers, Wearable technologies, Mental resilience, Health analytics, Military medicine, Performance optimization

48. (ID 456) Information Warfare – The Weapon of the 21st Century

Author: stud. Marius-Daniel PREDA

Scientific Advisor: Police Chief Marius-Florin MIHAILĂ

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *In a digitalized era where information travels at unprecedented speed, information warfare has become a top-tier strategic weapon in the arsenal of major powers. This form of conflict no longer relies solely on conventional forces but exploits social media, mass communication, and the cyber environment to influence perceptions, destabilize societies, and compromise decision-making processes. This paper analyzes the main forms of information warfare disinformation, false narratives, and psychological manipulation and their impact on national and international security. Furthermore, it highlights modern counter-strategies such as media literacy, institutional resilience, and inter-agency cooperation. In an increasingly volatile geopolitical context, information warfare is no longer a latent threat but an active reality that shapes contemporary conflicts and redefines the concept of power.*

Keywords: Security; Cyber Environment; Psychological Manipulation

49. (ID 458) Leadership in Times of Crisis: A Comparative Analysis of Authoritarian Versus Democratic Styles

Authors: stud. Bianca ALEXE, stud. Laura TĂTAR

Scientific Advisor: Col. Assoc. Prof. Alexandru BABOȘ, PhD

Institution: University Senate, LFA, Sibiu

Abstract: *The paper comparatively analyzes the military leadership styles of Zelensky, Macron, Putin, and Xi Jinping within the current geopolitical context. Examining their responses to hybrid conflicts and strategic competition, the study highlights the differences between democratic and authoritarian leadership. Employing a research methodology that includes discourse analysis, case studies, and the comparison of theoretical frameworks of military leadership, this paper demonstrates the impact of leadership style on national cohesion and international relations. The conclusions emphasize the necessity of adaptable leadership to navigate the complex challenges of the 21st century.*

Keywords: *military leadership, democratic, authoritarian*

50. (ID 469) Mercenary Armies in the 21st Century: Between Private Actors, Hybrid Warfare, and the Challenge to International Law

Author: stud. Andrei-Marian HANȚIG

Institution: „Alexandru Ioan Cuza” Police Academy

Abstract: *In the 21st century, the function of mercenary soldiers has evolved far away from conventional definitions to include a broad array of private military and security companies (PMSCs) involved in contemporary wars. They are situated in the new political realities and act, at times, as hybrid conflict agents and extension agents of states' and non-state actors' strategic power. This article explores the character, motive, and functional roles of mercenary armies, with a focus on their involvement in asymmetric war, regime support, and resource conflict. It also explores the legal complexities surrounding their status under international humanitarian law and their bearing on state responsibility. Through analysis of recent case studies most significantly the Wagner Group in Ukraine and Blackwater in Iraq the article sheds light on the growing privatization of war and international security governance implications thereof.*

Keywords: *Private Military Companies, Hybrid Warfare, International Humanitarian Law, Mercenary Forces, Non-state Armed Actors*

51. (ID 473) Autonomous Underwater Vehicle - Capabilities and Potential

Authors: stud. Petrică-Iulian LUNGU, stud. Dimitrie DUNĂ

Scientific Advisor: Prof. Ion CHIORCEA, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The current global landscape reflects increased uncertainty regarding the origins and locations of threats, as well as the methods by which they may be executed. The term "asymmetric threat" is now common in security discussions, with a rising frequency of terrorist activities. For naval forces, traditional concepts such as "blue water" threats have lost relevance, shifting focus toward "brown water" or littoral regions. This change emphasizes the need for power projection, force protection, and expeditionary operations in coastal areas. Consequently, naval forces must develop new capabilities in maritime intelligence, surveillance, and reconnaissance (ISR); oceanographic surveys; mine warfare; antisubmarine warfare (ASW); and base security. Key areas of vulnerability include organic mine countermeasures and defense against small craft. To meet these evolving demands, effective integrated ISR, command, control, and communications (C3), and real-time knowledge are essential. Leveraging unmanned systems and employing unmanned surface vehicles (USVs) and unmanned undersea vehicles (UUVs) as nodes in sensor and communication networks will be critical for addressing contemporary threats.*

Keywords: *UUV, AUV, command, control, communications*

52. (ID 476) The Cognitive Dimension of the Nagorno-Karabakh Conflict

Author: stud. Casian-Dan TIHOVAN

Scientific Advisor: Police Chief Assoc. prof. Nicolae-David UNGUREANU, PhD

Institution: „Alexandru Ioan Cuza" Police Academy

Abstract: *This study analyzes the integration of electronic warfare (EW) and autonomous systems into information strategies, using the cognitive dimension of modern conflicts as a starting point.*

In the field of military sciences and information, this presentation aims to highlight how advanced technologies have reinterpreted the battlefield, with a particular focus on the informational component and psychological impact. The analysis of the 2020 Nagorno-Karabakh conflict underscores how the parties involved utilized various electronic and autonomous systems not only to hinder enemy operations but also to influence strategy and the decision-making process within the war. In the conclusion, the growing relevance of cognitive warfare in contemporary military doctrine is emphasized, reflecting a shift in which information dominance, supported by advanced technologies, becomes a key factor in achieving strategic objectives.

Keywords: *Electronic Warfare (EW); Autonomous Systems; Information Strategies; Cognitive Warfare; Nagorno-Karabakh Conflict; Psychological Impact; Strategic Objectives*

53. (ID 479) The Implementation of An Airborne Electronic Warfare system in the Romanian Air Force Military Doctrine

Author: stud. Tudor COLBEA

Scientific Advisor: Lieutenant Colonel, advanced instructor Mihai Alin MECLEA, PhD

Institution: "Henri Coanda" Air Force Academy

Abstract: *The electromagnetic spectrum has become an operational theatre of strategic importance, where military success is no longer determined solely by physical superiority, but also by the ability to deny, secure, and use electromagnetic capabilities. As a NATO border state, Romania is increasingly exposed to challenges such as GNSS disruptions and drone incursions, highlighting a growing electronic warfare presence near its territory. This paper analyzes the need to adapt the current Romanian Air Force doctrine, drawing upon national doctrinal documents, NATO strategic guidelines, and operational lessons from the conflict between Ukraine and the Russian Federation. It argues that electronic warfare must evolve from a secondary support function into a central element of both defensive and offensive doctrine. To reduce reliance on expensive,*

high-maintenance dedicated platforms such as the EA-18G Growler, Romania must find a modular, interoperable, and easily integrable solution compatible with existing airframes. Considering NATO's C4ISR architecture and recent operational trends, the integration of electronic warfare as a doctrinal priority is essential to strengthening national defense postures and the Alliance's eastern flank.

Keywords: *military doctrine, electronic warfare, air force, electromagnetic spectrum, interoperability, NATO*

54. (ID 480) The Influence of Terrain and Weather on Tactical Actions

Authors: stud. Florin RANGA, stud. Andrei CROITOR

Scientific Advisor: Col. Radu MONORANU

Institution: Land Force Academy, Sibiu

Abstract: *Throughout human history, armed conflict has spanned diverse geographical regions, each defined by unique climatic and terrain characteristics, from frigid polar zones with extreme temperatures and sparse vegetation to arid deserts with scorching heat. Evidently, each climate and landscape demand a distinct strategic approach. Armed forces that adeptly adapted to these environmental factors often gained a significant advantage, sometimes securing victory, while those who failed to recognize their importance were forced to battle not only their enemies but also the unforgiving terrain and weather. After all, from a above, this study wants to present both the influence of land and weather, from the point of view of armed conflicts, by providing pertinent historical examples and from the point of view of modern military laws and regulations.*

Keywords: *history, climatic, terrain, advantage*

55. (ID 487) The Role of Simulations and Virtual Reality in Military Training

Author: stud. Daniel-Mihai MUNTEANU

Scientific Advisor: Liutenent Colonel Cătălin ENUTA

Institution: Academia de Poliție „Alexandru Ioan Cuza”

Abstract: *Simulations and virtual reality play a crucial role in modern air and naval military training by providing realistic,*

controlled, and immersive environments for personnel development. These technologies enhance mission planning, situational awareness, and decision-making under pressure, while significantly reducing the risks and costs associated with live training exercises. Through advanced modeling and interactive scenarios, trainees can repeatedly practice complex operations, improve coordination, and adapt to dynamic challenges. Their integration contributes to more effective, flexible, and technologically advanced military forces.

Keywords: *Simulations, Virtual Reality, Military Training, Situational Awareness, Mission Planning*

56. (ID 488) Cybersecurity and National Defense in Romania: Strategic Challenges and NATO Cooperation in the Digital Era

Author: stud. Ingrid-Maria BUNESCU

Scientific Advisor: Lecturer Andra PÎNZARIU, PhD

Institution: Nicolae Bălcescu Land Forces Military Academy

Abstract: *This paper examines Romania's evolving role in cyber defense through two complementary perspectives: strengthening cooperation with NATO and the United States, and responding to the increasing number of cyber threats against critical national infrastructure. Romania has asserted itself as an active ally in joint exercises and initiatives, leveraging NATO's Cooperative Cyber Defence Centre of Excellence expertise in Tallinn (Estonia) and participating through the National Cyber Security Directorate in large-scale maneuvers such as Cyber Coalition, Locked Shields, and the DEFENDER Europe series, while its partnership with the USA includes information exchange and technical assistance programs that strengthen the allied network. At the same time, a recent wave of cyberattacks, from Distributed Denial-of-Service attacks and ransomware operations against The National Agency for Fiscal Administration and the Ministry of Transport, to attacks on hospital imaging systems and the national electricity grid, has exposed the inability to quickly detect, isolate, and remediate incidents triggered by advanced groups such as APT28 and Killnet (pro-Russian). These events emphasize the urgent need to quickly implement both reactive and preventive measures outlined in the National Cybersecurity Strategy 2022-2027. The strategy combines allied expertise with internal forces and resources to strengthen Romania's control over*

its digital space and enhance cyber resilience, ensuring that attacks are deterred both nationally and in cooperation with NATO.

Keywords: *cyber defense, resilience, cyberattacks*

57. (ID 493) Reverse Engineering and Technological Theft: Definition, Evolution from Ancient to Modern Warfare and Counterstrategies

Author: stud. Andrei Cătălin FILOFTEIU

Institution: „Alexandru Ioan Cuza” Police Academy, Bucharest

Abstract: *Throughout history, reverse engineering has often been a key tactical shortcut to overtake superior forces and has helped achieve military dominance. This presentation goes in depth about what reverse engineering really is and how it has served as a decisive force multiplier in warfare, from antiquity to the digital age. We begin by defining reverse engineering as the process of replicating a device, object or piece of software in order to understand how it works, without having access to its original blueprints. From there, we go more in depth unpacking the reasoning behind technological theft. Apart from explaining the concept of backward engineering, this paper examines different cases of technological theft throughout history. First, we present Rome's rapid naval modernization during the Punic Wars, then we bridge to contemporary examples like China's replication of Russian jets or Iran's development of drones based on the ones captured from the U.S. This presentation also expands upon the risks of reverse engineering: inherited design flaws, ethical risks regarding privacy violation or unfair competition, the dependence it creates in time. Finally, the study proposes some counter tactics in order to avoid or to confront information theft and intelligence leaks such as deliberate sabotage, feeding flawed designs or deceiving the enemy into discovering fake plans.*

Keywords: *reverse engineering, military dominance, naval modernization, information theft, warfare*

58. (ID 130) Implementation of NATO AML Standards in Romania's Area of Responsibility in the Black Sea

Authors: stud. Lia-Gabriela PASCARU, stud. Sorin SCORUȘ

Scientific Advisor: Lecturer DUMITRACHE Lucian, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper presents an analysis of how Romania applies NATO standards in the Black Sea area. The types of AML, the steps necessary to realize a research plan, as well as the practical aspects related to the application of these standards are presented. The importance of cooperation with NATO allies is emphasized. The aim of the paper is to show how Romania can improve its AML capabilities in order to effectively contribute to maritime security in the region.*

Keywords: *Romania, NATO, AML, Black Sea region, standard implementation, maritime security*

59. (ID 131) The Role of Information Technologies in Modern Military Strategies

Authors: stud. Andreea DAMIAN, stud. Stefan-Rares ONOFREI, stud. Alin Marinel LUPU

Scientific Advisor: Lieutenant Colonel Associate Professor HRAB Daniela-Elena

Institution: National Defence University "Carol I"

Abstract: *This study aims to examine how the integration of advanced technologies, such as artificial intelligence, digital systems, and cyber tools, is transforming the planning and execution of military operations. Using the literature review method, the research analyzes current findings from academic and strategic sources to assess the impact of digital transformation on modern warfare. The results highlight those technological advancements significantly enhance operational efficiency and strategic adaptability by enabling real-time communication, rapid data processing, and improved situational awareness. Simultaneously, the study identifies key vulnerabilities, including cyberattacks, espionage, and the risks associated with the autonomous use of AI in weapon systems. Ethical concerns also emerge regarding the control and accountability of AI-driven military actions. To mitigate these challenges, the study emphasizes the need for stronger cybersecurity frameworks, the development of clear international regulations, and the promotion of responsible use of emerging military technologies. Understanding these dynamics is essential for preparing for future conflicts and ensuring global security.*

Keywords: *Information technologies; Military strategies; Cybersecurity; Artificial intelligence; Autonomous systems; Cyber warfare; Ethical*

implications; Operational effectiveness; Digital infrastructure; Global security

60. (ID 143) Secosoft - The Impact of Hybrid Threats on The Planning and Conduct of Military Operations

Author: stud. Rares HALATIU

Scientific Advisor: Col. Dr. Dan COLESNIUC

Institution: Land Forces Academy

Keywords: *hybrid warfare, hybrid threats, military operations*

61. (ID 156) "Transforming Military Regulations through New Technologies: An Analysis of Procedural Adaptation"

Author: stud. Gabriel-Ștefan DASCĂLU

Institution: "Nicolae Balcescu" Land Forces Academy

Scientific Advisor: Lect. univ. Daniel SOLESCU

Abstract: *This paper aims to analyze the influence of new technologies on current military regulations, providing concrete examples and proposing methods for integrating these technologies into the infantry squad structure.*

Keywords: *hybrid warfare, military regulations, UAVs*

62. (ID 159) Space Warfare: Challenges and Opportunities for Global Security

Author: stud. Ana-Diana LAZĂR

Scientific Advisor: Capt Assist Prof Cosmina NECULCEA

Institution: Henri Coandă Air Force Academy

Abstract: *As humanity's reliance on space-based assets intensifies, space warfare has become a critical frontier in modern military strategy. The article aims to explore the evolving battlefield of conflict in space, focusing on the unique challenges and strategic considerations that define this domain. This paper examines the rapid advancement of space technologies, the increasing militarization of space, and the potential threats posed by both state and non-state actors. Key issues addressed include the development of anti-satellite weapons, the vulnerability of space infrastructure, and the legal and ethical implications of space militarization. The topic also evaluates current and proposed strategies for mitigating risks and enhancing security, including international cooperation,*

defensive measures, and technological innovation. By analyzing these aspects, the project aims to provide a comprehensive overview of the current state of space warfare and offer insights into future trends and strategic responses.

Keywords: *Space Warfare, Anti-Satellite Weapons, Space Militarization, Strategic Defense, International Cooperation*

63. (ID 177) Advanced Technology Data Equipment

Authors: stud. George HONT, stud. Marius STADOLEANU

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *In today's rapidly evolving digital landscape, advanced technology data equipment plays a critical role in the efficient handling, storage, transmission, and processing of vast amounts of information. These systems encompass a wide range of devices including high-performance servers, next-generation data centers, cloud computing infrastructures, and AI-integrated data processors. With the exponential growth of data generation in fields such as healthcare, finance, telecommunications, and smart cities, the need for fast, reliable, and secure data equipment has become more essential than ever.*

Keywords: *Unmanned Aerial Vehicle, Autonomus Underwater Vehicle, Unmanned Surface Vessels*

64. (ID 179) Social media- Source of information or brainwashing?

Author: stud. Mihai IUREA

Scientific Advisor: Lect. Dan COLESNIUC, PhD.

Institution: "Nicolae Bălcescu" Land Forces Academy

Abstract: *Nowadays, social media is everywhere. In a world where more than 70% of the population has a social media account, we need to ask ourselves what we use it for. As its beggining, the social media were supposed to unify people and to bring people together, by using different and new ways to communicate. But as the time passed, people found other usages of the social media, not only in a good way, but also in different negative ways. That brought us in a situation where different channels are used only to promote fake*

news or to indoctrinate people. The following article will present different perspectives of the social media usage among population.

Keywords: social media, communication, brainwashing

65. (ID 181) The Impact of Hybrid Threats on The Planning and Conduct of Military Operations

Author: stud. Rares HALATIU

Scientific Advisor: Lect. Dan COLESNIUC, PhD.

Institution: "Nicolae Bălcescu" Land Forces Academy

Abstract: *Hybrid threats, which combine conventional, irregular, cyber, and information warfare tactics, pose significant challenges to modern military operations. This article examines the impact of hybrid threats on the planning and execution of military strategies, emphasizing the need for adaptive and multidimensional approaches. Hybrid threats exploit vulnerabilities across political, economic, and technological domains, complicating traditional defense mechanisms and operational planning. The study explores how military organizations must integrate intelligence, cyber defense, strategic communication, and interagency cooperation to counter these evolving threats effectively. By understanding the complex nature of hybrid warfare, military planners can enhance resilience, improve decision-making, and ensure operational success in an increasingly unpredictable security landscape.*

Keywords: hybrid warfare, hybrid threats, military operations

66. (ID 182) "Implementation of the S-102 Standard from the S-100 Standards Framework within the Naval Forces"

Authors: stud. Paul-Alexandru CIOCAN, stud. Vasile Ionut PAVAL

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *High-resolution bathymetry has become an essential component of modern naval operations, significantly enhancing the capabilities of naval forces in both strategic planning and tactical execution. By providing detailed underwater topographic maps, high-resolution bathymetric data enables improved navigation safety, optimized route planning, and more precise deployment of underwater systems such as mines, autonomous underwater vehicles (AUVs), and sonar arrays. In anti-submarine warfare (ASW),*

accurate seafloor characterization enhances target detection and classification by accounting for acoustic propagation variability. Additionally, it supports amphibious operations by identifying suitable landing zones and potential underwater hazards. The integration of advanced sensors, such as multibeam echo sounders and lidar bathymetry systems, with data fusion techniques and real-time processing has further empowered naval forces to maintain a strategic advantage in complex marine environments.

Keywords: *High-resolution bathymetry, naval forces, seafloor mapping, real-time data processing, maritime situational awareness, oceanographic data fusion, multibeam echo sounder, lidar bathymetry*

IV. SECTION: ELECTRICAL ENGINEERING

Section Committee:

Chairman: Prof. Gheorghe SAMOILESCU, PhD

Members: Lecturer Leon PANĂ, PhD

Lecturer Eduard DRAGOMIR, PhD

Stud. Gabriela-Estera IANCU

Stud. Denis-Marian BĂRBIERU

Stud. Mircea-Gabriel LUNGU

Room: LI356

1. (ID 1) Atex Sensors for Temperature and Pressure Monitoring

Authors: stud Lucian PENIU, stud. Mario Andrei BUZOIANU

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project explores the use of ATEX sensors for monitoring temperature and pressure in industrial environments with explosion risk. The main objective is to develop a safe and efficient monitoring system using ATEX-certified sensors.*

Keywords: *petre-lucian. peniu.020301*

2. (ID 5) Analysis of the Operating Principles of a Quadcopter

Authors: stud Armand-Constantin BEIU, stud. Valentina ANUȚEI, stud. Filip Marian ARHIRE

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes the operating principles of a quadcopter, a type of unmanned aerial vehicle equipped with four rotors. The study focuses on flight dynamics, stability control, and navigation algorithms. It presents fundamental concepts of aerodynamics, the distribution of forces and moments generated by the motors, and their impact on the drone's movement. Additionally, the control systems, including sensors and microcontrollers that ensure balance and maneuverability, are discussed. The project*

provides a detailed perspective on how these components interact to enable stable and efficient flight.

3. (ID 6) Automation of a Packaging and Labeling Process Using Logo Soft Comfort V7 and Cade Simu

Authors: stud Ionuț SILION, stud. Armand-Constantin BEIU, stud. Filip Marian ARHIRE

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project focuses on the automation of a packaging and labeling process using a Programmable Logic Controller (PLC). The goal is to enhance efficiency, reduce human intervention, and ensure high precision in product handling. The system integrates sensors, actuators, and a conveyor mechanism controlled by a PLC programmed using Logo Soft Comfort V7. Additionally, Cade Simu is employed for simulation and validation of the control logic before implementation. The automation sequence includes product detection, positioning, packaging, and label application, with real-time monitoring to ensure smooth operation. Error detection and feedback mechanisms are incorporated to minimize production defects. The implementation of this automated system results in improved production speed, consistency, and reduced operational costs, making it a reliable solution for modern industrial packaging processes.*

4. (ID 8) Operational Characteristics of Maritime Radars

Authors: stud Filip Marian ARHIRE, stud. Armand Constantin BEIU, stud Ionuț SILION

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maritime radars play a crucial role in navigation, collision avoidance, and situational awareness for vessels operating at sea. This presentation explores the operational characteristics of maritime radars, focusing on key aspects such as detection range, resolution, target discrimination, and environmental influences on performance. Factors affecting radar efficiency, including signal processing techniques, antenna design, and frequency selection, are also analyzed. Additionally, the impact of weather conditions, sea*

clutter, and technological advancements in radar systems are discussed. Understanding these characteristics is essential for optimizing radar performance and ensuring maritime safety in various operational scenarios.

5. (ID 10) Development of a custom digital transceiver for UAV communication

Author: stud Teodor-Mihail GIURGICĂ

Scientific Advisor: Assoc. prof. Annamaria SÂRBU, PhD

Institution: Land Forces Academy "Nicolae Balcescu" Sibiu

Abstract: *In modern drone warfare, reliable communication is crucial for operational success. This research presents the development of a digital transceiver for drone communication, utilizing Software-Defined Radio (SDR) and Binary Phase Shift Keying (BPSK) modulation to overcome spectrum congestion in the 2.4 GHz band. By integrating a 433 MHz RF transceiver, the system enhances long-range, low-latency data transmission for UAVs. The implementation process includes signal modulation, hardware integration, and real-time spectrum analysis, offering a robust and adaptable communication framework.*

Keywords: SDR, UAV Communication, BPSK Modulation, 433 MHz, Drone Control, Spectrum Congestion, Wireless Data Transmission, Remote Piloting, Tactical Drones, Electronic Warfare.

6. (ID 19) Advanced Technology to Ensure Safety in Navigation

Author: stud Andrei ZAHARIA

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *In the rapidly evolving field of navigation, the integration of advanced technologies plays a crucial role in ensuring the safety and reliability of modern transportation systems. This paper explores the latest innovations in navigation technologies, focusing on their application in both maritime and terrestrial environments. Key developments such as autonomous navigation systems, artificial intelligence (AI)-driven decision-making processes, real-time data analytics, and advanced sensor systems are transforming how navigation is approached. These technologies work in tandem to enhance situational awareness, minimize human error, and enable*

predictive safety measures. Additionally, the increasing use of satellite-based navigation, machine learning algorithms, and sensor fusion contributes significantly to optimizing route planning, collision avoidance, and emergency response protocols. As navigation systems continue to evolve, the adoption of these advanced technologies is expected to reduce accidents, improve efficiency, and ensure greater safety for both passengers and cargo. The future of navigation lies in creating interconnected, intelligent systems capable of responding dynamically to challenges, thereby safeguarding the integrity of global transport networks.

Keywords: Radar, AIS Systems, Vessel Traffic System

7. (ID 21) Optimizing Maritime Transport Through AI, Autonomous Systems, and Green Technologies

Authors: stud Sebastian-Valentin PARMAC, stud. Alexandru-Daniel SPIRU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The maritime transport industry plays a pivotal role in global trade, but it faces challenges related to efficiency, safety, and environmental sustainability. This paper explores the potential of integrating Artificial Intelligence (AI), autonomous systems, and green technologies to optimize maritime operations. AI-driven systems can enhance route planning, predictive maintenance, and operational efficiency by processing vast amounts of data, reducing human error, and improving decision-making in real-time. Autonomous vessels, equipped with advanced sensors and AI, offer the potential to reduce crew-related costs, enhance safety, and decrease human-related accidents. Additionally, the adoption of green technologies, such as renewable energy sources, energy-efficient hull designs, and emission-reducing technologies, is crucial for reducing the environmental impact of maritime transport. This paper discusses the synergies between these innovations, examining how they can drive sustainability and performance improvements in the industry. The paper also highlights challenges such as regulatory hurdles, high initial investment costs, and the need for robust cybersecurity measures, while emphasizing the long-term benefits of*

these advancements in fostering a more efficient, safe, and environmentally-friendly maritime sector.

Keywords: *Autonomous Systems, and Green Technologies, AI*

8. (ID 25) Technical Solutions for Preventing Piracy in Commercial Navigation

Authors: stud Rafaelo DECIANU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maritime piracy remains a serious threat to the safety of commercial shipping and global economies. Preventing such attacks requires the implementation of advanced technical solutions to protect vessels and crews. Effective technical measures include satellite and radar monitoring systems that provide continuous tracking of vessels and early detection of suspicious activities in high-risk areas. Communication technologies, such as satellite-based systems, along with drones and autonomous vehicles for patrolling waters, play a key role in enhancing rapid response and deterrence. Additionally, physical security measures on vessels, such as anti-piracy barriers, electric fences, and self-defense weapons, help prevent attacks. Cybersecurity measures, including encryption of communications and software designed to detect and prevent cyber-attacks, are also crucial in safeguarding vessel navigation and control systems from unauthorized access. These technical solutions, when integrated into a global framework of cooperation between nations and international organizations, are essential for mitigating risks and ensuring the protection of commercial shipping from piracy.*

Keywords: *Piracy, Preventing, attacks, satellite communication*

9. (ID 38) The Importance of Anti-Islanding Protection in Grid-Connected Renewable Energy System

Author: stud. Andrei-Dan FRĂTUȚU

Scientific Advisor: Captain Assoc. Prof. Paul BURLACU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Anti-islanding protection represents the most important safety mechanism in grid-connected renewable energy, preventing generation sources, such as solar photovoltaic (PV) and wind*

turbines, from continuing to supply power to an isolated section of the grid when the main utility supply is lost. Islanding poses significant risks, including electrical hazards for utility workers, equipment damage, power quality issues and grid instability. To reduce these risks, anti-islanding protection employs passive, active and communication-based detection methods to ensure rapid disconnection of distributed generators during grid failures. Compliance with international standards is essential to maintain safe and reliable grid operations. Also, the advancement of smart inverters and microgrid technologies has enhanced anti-islanding capabilities, allowing controlled transitions in between grid-connected and islanded modes in specific applications. This paper explores the importance of anti-islanding protection, its detection methods, regulatory requirements, and the role of modern inverters in maintaining a stable and secure power network.

Keywords: anti-islanding protection, power quality, voltage and frequency stability

10. (ID 39) Study on Wireless Charging Technology for Electric and Hybrid Vessels

Authors: stud Andrei-Dan FRĂTUȚU

Scientific Advisor: Captain Assoc. Prof. Paul BURLACU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: The advancement of wireless charging technology presents a promising solution for powering electric and hybrid vessels, eliminating the need for physical connectors and enhancing operational efficiency. This study explores the principles, design, and implementation of wireless power transfer (WPT) systems for maritime applications. Key focus areas include high-power inductive charging, system efficiency, electromagnetic compatibility, and integration with existing shipboard power systems. Additionally, the study examines the challenges related to energy transfer over water, environmental factors, and safety considerations. By analyzing current research and technological developments, this study aims to contribute to the adoption of wireless charging solutions, promoting cleaner and more sustainable maritime transportation.

Keywords: Wireless Power Transfer, Inductive Charging, Electric Ships, Maritime Electrification

11. (ID 47) Providing electricity for navigation systems in case of black-out using non-conventional energy with photovoltaic panels

Authors: stud Robert-Marian PÎRLEA, stud. Robert-Gabriel STOIAN

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

***Abstract:** In the event of a black-out, when traditional electrical power sources are unavailable, ensuring the continuous operation of navigation systems becomes critical, particularly for applications such as autonomous vehicles, delivery drones, or emergency response systems. One innovative solution to address this challenge is the use of non-conventional energy sources, particularly photovoltaic panels, to power these systems during power outages.*

This abstract explores the potential of photovoltaic panels to provide a reliable and sustainable energy source for navigation systems during black-outs. By harnessing solar energy, photovoltaic panels can generate electricity to maintain the operation of navigation equipment, ensuring autonomy and reliability even in the absence of conventional power grids. Additionally, energy storage systems and intelligent energy management technologies can be employed to optimize the efficiency and performance of these solutions.

The integration of photovoltaic-based power systems for navigation infrastructure not only enhances resilience in emergency situations but also contributes to reducing dependency on conventional energy sources, making navigation systems more sustainable. This approach plays a key role in ensuring the functionality of critical navigation systems during power disruptions, promoting both safety and environmental sustainability in the long term.

***Keywords:** black-out, non-conventional energy, photovoltaic panels*

12. (ID 48) The Use of Non-Conventional Energies to Ensure the Electrical Energy of Navigation Systems in the Event of Black-Out with Wind Generators

Authors: stud. Robert-Gabriel STOIAN, stud Robert-Marian PÎRLEA

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In the event of a black-out, ensuring the continuous operation of navigation systems becomes crucial, especially for critical applications such as autonomous vehicles, delivery drones, and emergency response systems. A promising solution to ensure reliable power during such outages is the use of non-conventional energy sources, specifically wind energy, through the deployment of wind generators.*

This abstract investigates the potential of wind generators to provide electrical energy to navigation systems during power disruptions. By converting the kinetic energy of wind into electrical power, wind generators offer a renewable, autonomous, and sustainable power source, ensuring that navigation systems continue to function even when traditional power grids are down. Additionally, the integration of energy storage systems and intelligent power management strategies can optimize the efficiency and performance of these systems, providing a continuous and stable energy supply.

Keywords: *Non-Conventional Energies, Electrical Energy, Wind Generators*

13. (ID 49) Decarbonization of navigation systems using non-conventional green energies

Authors: stud Alex-George CIREAȘA, stud. Theodor-Ionuț SARCU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The urgent need to mitigate climate change has highlighted the importance of reducing carbon emissions across all sectors, including transportation. The decarbonization of navigation systems plays a crucial role in this global effort, with non-conventional green energies offering promising solutions to replace traditional fossil fuels. Sources such as solar, wind, green hydrogen, and biofuels provide viable alternatives, enabling cleaner, more sustainable maritime and inland waterway transport. This paper explores the emerging technologies and innovative solutions for integrating these green energy sources into navigation infrastructure. It examines both the technical challenges and the economic and environmental benefits associated with their implementation. Additionally, the study discusses strategies for the integration of renewable energy into maritime and inland transport systems, highlighting their potential to*

significantly reduce greenhouse gas emissions and contribute to the achievement of global sustainability goals.

Keywords: *Decarbonization, navigation systems, non-conventional green energies*

14. (ID 58) Power Electronics

Authors: stud Bogdan GRIGORE

Scientific Advisor: Lecturer Eduard DRAGOMIR, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Power electronics involve converting electrical energy using inverters (DC to AC), rectifiers (AC to DC), and converters to adjust voltage and current, essential in renewable energy, motor drives, and electric vehicles.*

Keywords: *Power Electronics, Inverters, Rectifiers, Converters, Power Semiconductor Devices (IGBTs, MOSFETs)*

15. (ID 59) The Role of Maintenance and Optimization of the Maintenance System

Author: stud Ionuț BALAN

Scientific Advisors: Prof. Gheorghe SAMOILESCU, PhD,

Lecturer eng. Florin POSTOLACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maintenance plays a crucial role in ensuring the reliability, safety, and operational efficiency of equipment and systems across various industries, including the naval sector. Effective maintenance management helps reduce unplanned downtime, minimize repair costs, and extend the lifespan of components. Optimizing the maintenance system involves implementing modern strategies such as predictive maintenance, relational databases, and process automation to enhance intervention efficiency and improve decision-making. A well-structured system enables real-time equipment monitoring and optimal intervention planning, contributing to the safety and sustainability of operations. In conclusion, integrating advanced technologies and intelligent maintenance management is essential for the performance and competitiveness of organizations.*

Keywords: *Maintenance*

16. (ID 60) Creating a Maintenance Program from An It Point of View

Author: stud Ionuț BALAN

Scientific Advisors: Prof. eng. Gheorghe SAMOILESCU, PhD,
Lecturer eng. Florin POSTOLACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper presents the development of a maintenance management program using MATLAB, designed to optimize maintenance processes through a structured and efficient approach. The program integrates a relational database to store and manage maintenance records, ensuring easy access to critical information such as maintenance type, installation date, and responsible personnel. It supports both local (SQLite) and external (MySQL) databases, enhancing flexibility and data management. Additionally, the program features a graphical user interface (GUI) for intuitive interaction, allowing users to monitor, update, and analyze maintenance activities effectively. By automating data entry and retrieval, the system reduces human error and improves decision-making. The implementation of this software contributes to increased operational efficiency, reduced downtime, and improved equipment reliability. This project highlights the importance of IT solutions in modern maintenance management, emphasizing the role of automation and data-driven strategies in optimizing maintenance operations.*

Keywords: Maintenance catalog

17. (ID 69) Naval Vessel's Steering System

Authors: stud. Theodor-Ioan CIOCAN, stud. Andrei CREȚU

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The steering gear and helm system of a naval vessel are essential components that ensure the ship's maneuverability, control, and overall navigational efficiency. These systems work in tandem to allow the ship to respond to helm commands, providing precise directional changes that are crucial for safe operation in various maritime conditions.*

Keywords: Ship Steering System (Steering Gear and Helm System)

18. (ID 71) The Propulsion System on Board a Maritime Vessel

Authors: stud. Andrei CREȚU, stud. Theodor-Ioan CIOCAN

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The propulsion system is the fundamental component of a maritime vessel, ensuring efficient movement and maneuverability across the seas. This system consists of various interconnected elements, including the main engine, transmission system, shafting, propeller, and auxiliary components, all working together to provide the necessary thrust. The selection of a propulsion system depends on factors such as vessel type, operational requirements, fuel efficiency, and environmental regulations.*

Keywords: *The Propulsion System on a Maritime Vessel*

19. (ID 73) The maintenance of electric motors using vibration analysis

Authors: stud Alexandru George FRANGU, stud. Erol GAZI

Scientific Advisor: Lecturer Tiberiu PAZARA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *One of the investigation tools to discover the problems of an electric motor is vibration measurement and analysis. The advantage of this method is that it is not intrusive. Over the years, specialized software was developed to analyze the vibrations produced by electric motors, but also to model and simulate how electric motors are operating. In this paper, we present the results of the simulations made with Ansys MotorCAD. This software is capable to estimate how vibrations influence the performance of an electric motor. Our conclusions show that the capabilities of the motor can be improved after running various scenarios with this software.*

Keywords: *electric motor, vibrations, simulation*

20. (ID 74) The Noise Produced by Wind Turbines

Authors: stud Andrei Alexandru DAN, stud. Alexandru Florin RISTEA

Scientific Advisor: Lecturer Tiberiu PAZARA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: Wind turbines are a valuable component of the electric grid in a country where areas with strong are present. Thus, the turbines can be installed on land, but also at sea. Research showed that wind farms can produce an important noise level that can affect both wildlife and humans depending on location. In this paper, we study the propagation of noise produced by a wind farm placed at sea. The tool used is a simulation software, iNoise. We chose a coastal area where a number of wind turbines where installed. The map was taken from the available ones and after the setting of parameters, various scenarios were made. Our conclusion is that a simulation software is an important tool in order to assess the impact of a large number of wind turbines over the environment.

Keywords: wind turbine, noise, simulation, environment

21. (ID 75) The Acoustic Signature of a Wind Turbine

Authors: stud Nicola Sorin COTEANU, stud. Daniel Petre TURLICA

Scientific Advisor: Lecturer Tiberiu PAZARA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: In this paper, we study the propagation of noise produced by a single wind turbine placed on land. The tool used is a simulation software called iNoise. In order to make the simulations, a map of the area where the wind turbine is installed has to be imported, then some parameters regarding the noise source – the wind turbine – have to be set. The simulations took into account the presence of constructions, natural landforms so that multiple scenarios to be evaluated. The conclusions of this paper show that the variations of the noise level depend on the terrain configuration and presence of constructions. Also, there are variations in noise spectra based on the nature of soil and construction materials. The final conclusion is that by using a simulation software, the acoustic signature of a wind turbine can be obtained and the effect on environment can be anticipated.

Keywords: wind turbine, noise, simulation, acoustic signature

22. (ID 78) Use of vibration transducers for electric machines

Authors: stud Alexia-Mădălina IOSIF, stud. Raluca-Georgiana SOARE

Scientific Advisor: Lecturer Tiberiu PAZARA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper discusses the necessity of using vibration transducers in the field of electrical equipment, so that the appropriate variants can be chosen to investigate reliability by vibration measurement. The components of vibration transducers and the measurement chain used are presented. As an example, an electric motor has been chosen on which vibration measurements have been carried out and then simulations of its operation have been performed. The results of the measurements and simulations are discussed, and the conclusions show the relevance of the use of vibration.*

Keywords: *vibration, transducers, electric motor, measurements*

23. (ID 79) Compensation of the Z_{px} and Z_{ix} components using a magnetic dipole

Authors: stud Denisa Ștefania ROȘU, stud. Camelia Georgiana ION

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The compensation of magnetic field components using a magnetic dipole is a crucial technique in various scientific and technical applications, including magnetic sensors, electromagnetic shielding devices, and laboratory experiments. This paper analyzes methods for compensating the Z_{px} and Z_{ix} components of the magnetic field by utilizing an appropriate magnetic dipole. It discusses the fundamental principles of magnetic dipoles, their influence on the surrounding magnetic field, and practical applications of these concepts. The study highlights the importance of magnetic field compensation in improving measurement accuracy and reducing external interferences.*

Keywords: *magnetic compensation, magnetic dipole, magnetic field, magnetic components, electromagnetic shielding, magnetic sensors, magnetic measurements*

24. (ID 81) Study on Radio Direction Estimation Algorithms

Author: stud Andreea APOSTOL

Scientific Advisor: Annamaria SÂRBU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy

Abstract: *This paper looks at how radio direction estimation algorithms are used to figure out where a radio signal is coming from. The study focuses on using two types of antennas: Uniform Linear Array (ULA) and Uniform Rectangular Array (URA). The antennas are tested in a simulation to find the direction of the signal's origin and to understand how the time and phase differences affect the signal when it reaches the antennas. The paper also explores how Direction of Arrival (DOA) algorithms impact the received signal. The comparison between ULA and URA antennas is shown through examples of more complex systems that could be built physically, not just in a computer simulation. These antennas have different features, such as the algorithms used for DOA, their orientation, and how they are represented mathematically.*

Keywords: radio, antenna, signal, systems, direction of arrival

25. (ID 98) Experimental Stand for Automatic Star-Delta Starting of Electric Motors

Authors: stud George-Viorel PĂUNA, stud. Rareș-Andrei CHIRIAC

Scientific Advisor: Lecturer Leon PANĂ, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This paper presents the design and testing of an experimental setup for automatic star-delta starting of three-phase induction motors with the application of Siemens LOGO! programmable logic controllers (PLCs). The paper presents the power and control circuit setup, safety devices, and measuring instruments, along with programming and simulation in LOGO! Soft Comfort. The star-delta configuration has been shown to be efficient in minimizing inrush currents and mechanical stress during the initiation. The application of sequential control logic allows for smooth and reliable operation. The arrangement is suitable for academic settings as well as small and medium industrial applications, offering a valuable reference for theoretical analysis and practical instruction of electrical drives and industrial automation.*

Keywords: *Star-delta starting, Three-phase induction motor, PLC, Siemens LOGO! Industrial automation, Experimental setup, Control systems*

26. (ID 100) The Use of Non-Conventional Energies in Ships – Comparative Solutions (Photovoltaic Cells and Wind Energy)

Authors: stud Alessandro TOMA-LAVRIC

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In the context of increasing concerns for environmental protection and the reduction of greenhouse gas emissions, the naval industry is exploring innovative solutions for supplying ships with energy from non-conventional sources. Two of the most promising sources of renewable energy are photovoltaic cells and wind power. This study aims to analyze and compare the efficiency of these shipboard power solutions, balancing the economic, technical and ecological aspects of each technology. Photovoltaic cells convert solar energy into electricity, an attractive option due to the near-universal availability of sunlight and the technology's falling costs. In contrast, wind energy capitalizes on the power of the wind, being a constant source of energy in maritime regions and areas with strong winds. The study will evaluate the performance of each technology according to variables such as climatic conditions, energy efficiency, implementation and maintenance costs, as well as the impact on the overall performance of the ship. Through the comparative analysis of these solutions, the study aims to provide an in-depth understanding of the advantages and limitations of each renewable energy source in marine applications, thus contributing to the development of more sustainable and energy efficient solutions in the marine industry.*

Keywords: *non-conventional energies, photovoltaic cells, wind energy*

27. (ID 101) Selectivity of Protection Systems for Distribution Transformers

Authors: stud Mario Andrei BUZOIANU, stud. Lucian Petre PENIU

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes the selectivity of protection systems for distribution transformers on board a ship, aiming to ensure safe and continuous operation of the marine electrical system. It studies the principles of protection coordination to ensure that faults are isolated quickly and efficiently without affecting the power supply to other essential equipment.*

28. (ID 106) Man Overboard Detection System Based on Smart Bracelets

Author: stud Ștefan-Alexandru ROȘU

Scientific Advisor: SR3 Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Man Overboard (MOB) accidents pose a significant threat to safety at sea, especially on passenger ships as cruise ships, but also on container ships, tankers and military vessels where rapid detection is critical. This study introduces an innovative solution using smart bracelets worn by both passengers and crew. Made from durable, water-resistant materials like polycarbonate, the bracelets are designed to perform reliably in maritime environments. These devices integrate water contact sensors, GPS, and heart rate monitoring. Upon detecting a person falling overboard, the bracelet automatically sends an alert to the bridge, triggering the rescue operation. Simultaneously, the ship's lighting system is directed toward the location of the person via the GPS signal, ensuring quick and precise intervention by the crew. This system enhances the efficiency of rescue operations and significantly reduces response time in MOB situations.*

Keywords: *Man, overboard system; smart bracelets; GPS; contact system; contact sensors*

29. (ID 107) Magnetic Levitation

Authors: stud Ștefan-Matei GANĂ, stud. Radu-Mihai RUSU, stud. Răzvan-Gabriel RUSU

Scientific Advisor: Lecturer eng. Eduard DRAGOMIR, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation explores magnetic levitation technology and its application in high-speed transportation. It explains how MagLev trains work, their types, advantages, disadvantages, and*

real-world examples. The goal is to highlight MagLev's potential to revolutionize modern transport through speed, efficiency, and environmental sustainability.

Keywords: *MagLev Trains*

30. (ID 110) Analysis of the Requirements Imposed on the Instrumentation Amplifier

Authors: stud Răzvan-Gabriel RUSU, stud. Radu-Mihai RUSU, stud. Ștefan-Matei GANĂ

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This presentation examines the key design requirements of instrumentation amplifiers (INAs), essential for accurate low-level signal amplification in noisy environments. Core parameters such as high CMRR, input/output impedance, low offset, and noise performance are analyzed. Practical applications in medical, industrial, and scientific systems highlight the impact of these features on signal integrity and system reliability.*

Keywords: *Instrumentation Amplifier*

31. (ID 202) High Availability and Load Balancing Web Server Hosting: A Custom Cloud Computing Approach

Author: stud Teodor GIURGICĂ

Scientific Advisor: Assoc. prof. Annamaria SARBU, PhD.

Institution: Land Forces Academy "Nicolae Bălcescu" Sibiu

Abstract: *This project bridges the gap between emerging technologies and real-world applicability, showcasing a powerful, portable computing solution built on a Raspberry Pi cluster. Acting as a self-contained edge supercomputer, this system integrates load-balanced, high-availability web server hosting with advanced, real-time machine learning capabilities. Using Docker and Kubernetes, the cluster dynamically adapts to high traffic and denial-of-service scenarios, ensuring uninterrupted service. Through Kubeflow, we unlocked efficient parallel and distributed ML training, enabling real-time retraining of algorithms directly in the field. A custom intrusion detection dataset was used to demonstrate intelligent threat detection capabilities. This fusion of web infrastructure resilience and on-site adaptive ML makes the system highly relevant to national*

security contexts. By integrating cloud-native technologies and AI into a portable system, this project demonstrates how intelligent, decentralized solutions can be deployed in any environment, offering scalable, adaptable infrastructure for a wide range of real-world applications. By implementing high availability and load balancing techniques, the system ensures continuous performance even under heavy traffic or adverse conditions, making it ideal for mission-critical applications that require constant uptime.

Keywords: *High Availability and Load Balancing Web Server Hosting: A Custom Cloud Computing Approach*

32. (ID 217) The Effects of Electromagnetic Waves on the Human Epidermis

Authors: stud Georgiana-Raluca SOARE, stud. Andreea-Iuliana GRIGORESCU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Electromagnetic waves are radiation formed by oscillating electric and magnetic fields, emitted by various sources such as the sun, mobile phones, and electronic devices. The electromagnetic spectrum includes non-ionizing radiation (radio waves, microwaves, infrared, visible light) and ionizing radiation (ultraviolet, X-rays, gamma rays). UV radiation can affect the epidermis, causing premature aging, sunburns, and skin cancer. Additionally, exposure to radio waves and microwaves can lead to local heating and oxidative stress. For protection, it is recommended to use SPF creams, limit screen exposure, and wear UV-protective clothing. Preventive measures are essential to reduce harmful effects on the skin and prevent dermatological conditions.*

Keywords: *electromagnetic spectrum, UV, electromagnetic waves, radiation*

33. (ID 220) Logic Gate Parameters in Microprocessor Systems

Authors: stud. Fabiola-Paula RUSU, stud. Mădălina FRĂȚILĂ

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper analyzes the importance of logic gate parameters in microprocessor systems. Key characteristics such as*

propagation delay, power consumption, noise margins, fan-in, fan-out, and input/output voltage thresholds are highlighted. These parameters directly affect the performance, reliability, and compatibility of digital circuits. A clear understanding and appropriate selection of these values are fundamental for designing efficient and stable systems.

Keywords: *logic gates electrical parameters microprocessor propagation delay power consumption noise margin fan-in fan-out logic voltage levels TTL/CMOS compatibility*

34. (ID 222) The Schottky Diode: Characteristics, Applications, and Advantages in Electronics

Authors: stud Mădălina FRĂȚILĂ, stud. Fabiola-Paula RUSU

Scientific Advisor: Lecturer eng. Eduard DRAGOMIR, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The Schottky diode is a semiconductor device characterized by a metal-semiconductor junction, offering a low forward voltage (0.15-0.45 V) and fast switching speed. Unlike traditional PN diodes, it operates with majority carriers (electrons), which allows for quicker response times. This makes it ideal for high-frequency applications, power electronics like switch-mode power supplies (SMPS), and high-speed rectifiers. Although the Schottky diode has a lower reverse voltage rating and a higher reverse leakage current, its efficiency and compact size make it a preferred choice in circuits requiring low power loss and rapid switching. This project explores the working principle, applications, and limitations of the Schottky diode, highlighting its crucial role in modern electronics.*

Keywords: *Schottky Diode, metal-semiconductor junction, low forward voltage, power electronics, SMPS, high-frequency, reverse voltage, leakage current, efficiency*

35. (ID 223) The Faraday Effect in Electromagnetic Field Theory

Authors: stud Fabiola-Paula RUSU, stud. Mădălina FRĂȚILĂ

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The Faraday Effect is a phenomenon where the polarization plane of light rotates as it passes through a material*

under a magnetic field parallel to the direction of propagation. Discovered by Michael Faraday, it demonstrates the interaction between light and magnetic fields and is described using Maxwell's equations. The effect depends on the Verdet constant, magnetic field strength, and the length of the light path. It has key applications in optics, sensors, and communication systems.

36. (ID 230) The Use of Unconventional Gyrocompasses on Maritime Vessels

Authors: stud Raul Costin RUSU, stud. David CACENCU

Scientific Advisor: Lecturer Eduard DRAGOMIR, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The Use of Unconventional Gyrocompasses on Maritime Vessels. This thesis explores the implementation of unconventional gyrocompasses in maritime navigation. It presents the technological evolution of gyroscopic systems, their operational principles, and their integration into modern navigation solutions. Conventional gyrocompasses are briefly reviewed, while particular attention is given to unconventional models such as ring laser gyroscopes (RLG), fiber-optic gyroscopes (FOG), and hemispherical resonator gyroscopes (HRG). The paper analyzes these systems in terms of construction, functionality, error sources, and calibration techniques. Additionally, the significance of miniaturization and MEMS technology is discussed in the context of improving performance, reliability, and adaptability. The study concludes by emphasizing the advantages of these systems compared to traditional magnetic compasses, especially in high-precision and autonomous navigation environments.*

1. Topic

The use of unconventional gyrocompasses on maritime vessels.

2. Purpose

To highlight the evolution of gyroscopic technology and its modern applications in navigation.

3. The Gyroscope

A core component in navigation systems, gyroscopes are essential for determining orientation and maintaining stability. They form the basis for both conventional and advanced gyrocompasses.

4. Conventional Gyrocompasses

*Utilize mechanical components for directional reference.
Typically balanced using: Weights, Mercury, Oil
Include: Gyromagnetic compasses, Mercury-floating compasses*

5. Unconventional Gyrocompasses

Based on advanced sensor technologies:

RLG (Ring Laser Gyroscope)

FOG (Fiber Optic Gyroscope)

HRG (Hemispherical Resonator Gyroscope)

These systems replace mechanical parts with optical or resonant components, offering higher performance.

6. Emerging Technologies

MEMS (Micro-Electro-Mechanical Systems) sensors enabling:

System miniaturization

Lower power consumption

Enhanced integration capabilities

Advanced calibration techniques and dynamic behavior analysis improve accuracy and performance.

7. Conclusion

Unconventional gyrocompasses are critical components in modern navigation. Their advantages over traditional systems make them indispensable in environments where precision, reliability, and autonomy are essential. Their role is increasingly prominent in marine, aerospace, and defense technologies.

37. (ID 248) Monitoring the Cargo Tank Levels on An Oil Tanker

Authors: stud Andrei DOȘCU, stud. Codrin GÎLCĂ

Scientific Advisor: Captain Assoc. Prof. Paul BURLACU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper aims to present the importance of monitoring in the context of environmental risks, a general overview of a cargo tank level monitoring system, the role of such a system, and its operating principle.*

Keywords: *Monitoring the levels in cargo tanks, oil tanker*

38. (ID 257) Importance of Using a Protection Relay

Authors: stud Andrei PLINGE, stud. Octavian-Marian MOISA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this presentation I will show the importance of using a protection relay along with the advantages, disadvantages and long-term reliability of such a relay. The interest of this presentation is to inform both domestic and industrial consumers for the commissioning of such a relay, and I will physically show what such a relay looks like.*

Keywords: *protection, relay, safety*

39. (ID 264) SDR-Based System for Jamming Frequency Hopping Radio Equipment

Author: stud. George Eduard POPA

Institution: "Nicolae Bălcescu" Land Forces Academy of Sibiu

Abstract: *The proposed experimental work presents the design and implementation of a Software Defined Radio (SDR) based system for monitoring and jamming of frequency hopping radio equipment, a key component of modern military communication networks. Frequency Hopping Spread Spectrum Spread Spectrum (FHSS) technology is widely used in tactical scenarios due to its inherent resistance to jamming and interception, making it a prime target in electronic warfare operations. The proposed system combines open-source software (GNU Radio) and cost-effective hardware (ADALM-PLUTO) to develop a dual-function platform capable of both spectral monitoring and reactive jamming. Electromagnetic spectrum monitoring integrates custom Python blocks for adaptive noise threshold computation and frequency sensing, providing real-time signal discrimination and active channel recording in a frequency-hopping environment. These signals are visualized through dynamic spectrograms and saved in *.CSV format for further analysis. The jamming module is built to perturb the detected FHSS signals by synchronizing the transmission with the detected frequency pattern. Both modules are integrated in a compact and mobile Raspberry Pi 4B-based Raspberry Pi 4B platform, enabling electronic countermeasure operations deployed in the field. Laboratory experiments confirmed the system's ability to detect and jam FHSS signals in real time over a maximum acquired bandwidth of 10MHz with a single low-cost device (one channel used for reception and one channel used to emit jamming on the recorded frequencies). The*

system has also been tested to monitor, record and jam signals with 1000 hops per second, the maximum capability specific to military frequency hopping radio stations. This research contributes to a scalable, low-cost and flexible SDR-based solution suitable for military applications including electronic monitoring and tactical jamming. The developed system supports real-time monitoring and countermeasure actions, enhancing communication security and situational awareness in congested electromagnetic environments.

Keywords: SDR, Frequency hopping, jamming

40. (ID 272) Study on Electromagnetic Wave Propagation in Water for Wireless Charging of Underwater Drones

Author: stud Ovidiu-Andrei BOALCA

Scientific Advisor: Lecturer eng. Vlad MOCANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Study on Electromagnetic Wave Propagation in Water for Wireless Charging of Underwater Drones*

This paper explores the feasibility and performance of wireless power transfer (WPT) systems designed for underwater applications, with a focus on powering autonomous underwater vehicles (AUVs). The study examines the behavior of electromagnetic fields, especially magnetic fields, in conductive environments such as seawater, taking into account key physical properties like salinity, conductivity, and permittivity, which significantly influence signal attenuation and transmission efficiency. The main objective is to identify how factors such as frequency, distance, coil alignment, and medium properties affect the efficiency of underwater energy transfer. The analysis is supported by simulations conducted in ANSYS Maxwell, using different coil geometries and operating frequencies. Several modeling techniques are adapted from recent scientific literature, including works such as “Underwater Wireless Power Transfer” (H. Ryou et al., 2016), “Application of Shielding Coils in Underwater Wireless Power Transfer Systems” (A. Kiani et al., 2019), and “Modeling Wireless Power Transfer in Marine Environment via Integrated Electromagnetic Field and Circuit Analysis” (M. Yamaguchi et al., 2023), all available on ResearchGate. Results show that low-frequency magnetic fields can achieve more effective penetration in seawater, but the efficiency is highly sensitive to

system alignment and environmental parameters. The study provides useful design guidelines and highlights both the limitations and potential of implementing WPT technology in marine environments. This research contributes to the development of reliable, wireless energy solutions for underwater robotics, addressing one of the key challenges in the operation of autonomous systems in submerged conditions.

Keywords: *Wireless Power Transfer (WPT), Underwater Drones, Electromagnetic Field Propagation, Seawater Conductivity, ANSYS Maxwell Simulatio*

41. (ID 289) Simulating and Measuring the Average and Root Mean Square Values of Waveforms Using Tina-TI Software

Authors: stud Denisa Ștefania ROȘU, stud. Cristian TUDOR

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper investigates the determination of the average value and the root mean square (RMS) value of various waveform types used in electronics through numerical simulation using the Tina-TI software platform. Fundamental periodic signals — sinusoidal, triangular, and square waveforms — are analyzed, with their parameters calculated both theoretically and through simulation. The methodology involves the construction of virtual circuits and measurements using the built-in instrumentation tools provided by the software environment, highlighting the correlation between analytically computed values and those obtained via simulation. The results confirm the accuracy of Tina-TI in waveform analysis and emphasize its relevance in modeling and verifying signal behavior in electrical and electronic circuits.*

Keywords: *Tina-TI, electronic simulation, average value, root mean square (RMS), waveform analysis, periodic signals, signal measurement*

42. (ID 291) Voltage Regulators

Author: stud Alexandru-Valentin TUDORAN

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation aims to show a little electrical installation that is frequently used in most of electronics nowadays - that installation is called a voltage regulator. It'll introduce the people with a short and simple definition for anyone to understand, try to explain its working principle and few examples of usage of the voltage regulators in everyday life.*

Keywords: *Voltage Regulator, Electrical Installation, working principle*

43. (ID 293) The Dispersion Field of Representative Equipment and Cables in Low Voltage (L.V.) Networks

Authors: stud Andrei-Gabriel ROMANESCU, stud. Mircea-Gabriel LUNGU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *This presentation examines the behavior and effects of dispersion fields in low voltage (LV) electrical networks, emphasizing how voltage, thermal, and electromagnetic (EM) dispersions affect system performance and safety. Essential elements like cables, circuit protection devices, and distribution boards are examined, highlighting material characteristics and structural organization. The research explores cable features, such as insulation varieties and conductor shapes, and their influence on heat buildup, voltage reduction, and electromagnetic interference. Real-world layouts for residential and industrial networks demonstrate practical difficulties and solutions, including EM shielding and cable management. The significance of load balancing, reducing cable lengths, and maintaining phase separation is emphasized for efficiency and reliability of the system. The conclusion emphasizes the importance of proactive design through simulation tools and following best practices to avoid failures, particularly in sensitive environments or those with high currents. This detailed summary assists engineers in enhancing LV network design for safety, efficiency, and adherence to regulations.*

Keywords: *Dispersion Fields, Low, Voltage Networks, Electromagnetic Interference, Voltage Drop*

44. (ID 304) Accelerometers, Basic Instruments in Modern Navigation

Authors: stud Octavian-Marian MOISA, stud. Andrei PLINGE

Scientific Advisor: Lecturer Eduard DRAGOMIR, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *In this presentation I will show what an accelerometer is and their importance in ship stabilization platforms, a key component for modern navigation.*

45. (ID 316) Prototype Development of a Military UGV Chassis for Ground Combat, Tactical Communication and Engineering Support Roles

Author: stud Vladin FOCA

Scientific Advisor: Assist. Prof. Annamaria SÂRBU, PhD

Institution: "Nicolae Bălcescu" Land Forces Academy

Abstract: *The ongoing development of Unmanned Ground Vehicles (UGVs) plays a pivotal role in modern military operations, offering versatile support for ground combat, tactical communication, and engineering missions. This abstract presents the prototype development of a military UGV chassis, designed to serve as a flexible and scalable platform for future autonomous systems. The prototype is constructed using a Raspberry Pi 4 Model B, microcomputer, equipped with a generic Raspberry Pi camera module, four DC motors, and a lead-acid battery, ensuring sufficient operational endurance for field testing. The UGV employs a tracked chassis configuration, which provides enhanced terrain mobility and stability in off-road conditions. The vehicle is remotely controlled via WiFi communication, allowing command transmission from a standard laptop, which serves as the primary control station. This configuration was chosen to balance affordability and modularity, enabling iterative hardware and software development. Initial tests validate the UGV's ability to execute remote commands reliably in short and medium-range scenarios, offering a stable foundation for future system integration such as LiDAR-based navigation, sensor fusion, and autonomous pathfinding. The chassis is designed with modularity in mind, enabling the mounting of mission-specific*

equipment such as weapon systems, communication modules, or engineering tools for obstacle laying in field conditions.

Future development will focus on refining the platform's mechanical durability, expanding its autonomous capabilities, and integrating real-time data acquisition systems to enhance its operational value on the battlefield. This prototype aims to contribute to the advancement of low-cost, adaptable UGV systems tailored for military applications. This work was supported by a KING CAROL I-st research fellowship granted by the Romanian Ministry of Research, Innovation and Digitalization, contract number 11RCI/09.12.2024.

Keywords: *unmanned; autonomous; vehicle; chassis; prototype.*

46. (ID 323) The Importance of Using Gyroscopes in Military Technology

Author: stud. Florin COSACU

Scientific Advisor: Col. Assoc. prof. eng. Laurian GHERMAN, PhD

Institution: Academia Fortelor Aeriene "Henri Coanda"

Abstract: *In this presentation, I will introduce the concept of the gyroscope, explaining its basic structure and working principle. The focus will be on its applications in military technology, where it plays a crucial role in navigation, targeting systems, and missile guidance. I will also highlight the main advantages of gyroscopes, such as their precision, reliability, and ability to function under extreme conditions. The presentation aims to offer a clear and concise overview of the importance of gyroscopes in modern defense systems.*

Keywords: *gyroscope, military technology, navigation, precision, targeting systems, missile guidance*

47. (ID 329) "Next-Generation Modulation: Evaluating OTFS as a Replacement for OFDM"

Author: stud Cornelia GALBEN

Scientific Advisor: Maj Assoc. Prof. Annamaria SÂRBU, PhD

Institution: "Nicolae Bălcescu" Land Forces Academy

Abstract: *Orthogonal Time Frequency Space (OTFS) is a new method used in wireless communication. Unlike other modulation techniques, OTFS works in the delay-Doppler domain, which helps it perform better in fast-changing environments. This paper compares*

OTFS with a more common method called Orthogonal Frequency Division Multiplexing (OFDM). The comparison is done in a complex scenario with multiple signal paths, different signal-to-noise ratio (SNR) values, and various modulation types. To measure how well each method works, we use two indicators: Bit Error Rate (BER) and Error Vector Magnitude (EVM). The goal is to find the strengths and weaknesses of each technique.

Keywords: *delay-Doppler, high mobility channel, multipath propagation, performance analysis*

48. (ID 330) Trajectory Analysis of UAVs Under Aerodynamic Influences Using Simulink Modeling

Authors: stud Alexandra CRIȘAN, stud. Cornelia-Mihaela GALBEN

Scientific Advisors: Prof. Eng. Simona MICLĂUȘ, PhD, Maj Assoc. Prof. Annamaria SÂRBU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy, Sibiu

Abstract: *Drones, also called UAVs (Unmanned Aerial Vehicles), have changed many areas and improved people's lives in many ways. With the rise of artificial intelligence (AI) and self-flying drones, new opportunities have appeared, but also some questions about safety and ethics. This study looks at how a drone that can take off and land vertically behaves in a flat (2D) space, in two different situations: one without air forces and one with air forces. The main focus is on the drone's path, because it shows how well the drone stays stable and changes its position based on the forces around it and the control system used. This kind of analysis is important to help make drones work better and improve the way they are controlled in different situations.*

Keywords: *Aerodynamic effects, dual-rotor UAV, stability and control, flight path*

49. (ID 341) The use of Electromagnetic Railguns in Air Defense

Author: stud Roberta PASC

Scientific Advisor: Col. Assoc. prof. eng. Laurian GHERMAN, PhD

Institution: "Henri Coanda" Air Force Academy

Abstract: *Electromagnetic guns, also known as railguns or coilguns, represent a significant advancement in modern weaponry and*

propulsion systems. Utilizing electromagnetic force instead of traditional chemical explosives, these systems can launch projectiles at extremely high velocities with greater precision and reduced operational costs. Their importance lies in offering a cleaner, more efficient alternative for military and space applications, including long-range artillery, missile defense, and satellite launching. As research advances, electromagnetic guns could redefine the future of defense technology through enhanced efficiency, safety, and sustainability.

Keywords: *Electromagnetic gun, railgun, coilgun, advanced weaponry, projectile acceleration, military technology, energy efficiency, future defense systems.*

50. (ID 345) Operation of the Asynchronous Machine

Author: stud Andreea TOMA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper presents the operating principles of the asynchronous machine, a crucial electrical device widely used in industrial applications. It details the functional mechanism, focusing on the interaction between the rotating magnetic field and the rotor. The analysis includes the machine's performance characteristics, particularly the torque-slip curve, which is essential for understanding its dynamic behavior. Common applications are discussed, highlighting the machine's efficiency and reliability. The conclusions emphasize the asynchronous machine's significance in industrial environments and its advantages over other types of electric motors, such as simplicity, low maintenance, and cost-effectiveness.*

Keywords: *Asynchronous machine, slip, torque*

51. (ID 346) Analysis of a Voltage and Frequency Converter with Applicability in the Naval Power System

Author: stud Mihnea-Ștefan POPA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The voltage and frequency converter has established itself as an essential technological component in modern naval power*

systems, representing the optimal solution for ensuring compatibility between power sources and the wide variety of onboard equipment. This paper provides a comprehensive analysis of these devices, examining both fundamental theoretical aspects and practical applications in the maritime environment. The study highlights how modern converters have revolutionized the naval industry through the implementation of advanced energy conversion architectures. Through rigorous theoretical investigations and concrete case studies, the paper demonstrates the positive impact of these technologies on the key performance indicators of naval systems. Notably, significant improvements in energy efficiency are documented, with fuel consumption reductions of up to 25%, as well as remarkable increases in operational reliability. The detailed analysis of modern converter structures reveals their critical role in optimizing energy flows and reducing pollutant emissions. Advanced control technologies, along with the use of state-of-the-art semiconductors, have enabled the achievement of performance levels previously considered unattainable. The paper also examines the technical solutions implemented to address the specific challenges of the marine environment, including resistance to extreme operating conditions and electromagnetic compatibility. By exploring relevant case studies from the naval sector, the paper illustrates the concrete ways in which converters contribute to the sustainability of propulsion and power supply systems. Emerging trends in the field are also presented, with a focus on the development of smart converters equipped with adaptive capabilities and predictive diagnostics functions. The research results underline the enormous potential of these technologies in transforming naval power systems, while also offering a perspective on future development directions. The large-scale implementation of advanced converters is confirmed as a key strategy for achieving the energy efficiency and sustainability goals of the modern naval industry.

Keywords: Voltage Converter; Frequency Converter; Naval Power Systems; Energy Efficiency; Operational Reliability; Energy Conversion; Marine Environment; Advanced Control Technologies; Semiconductor Devices; Electromagnetic Compatibility; Propulsion Systems; Predictive Diagnostics; Sustainable Development

52. (ID 348) Speed Control of Asynchronous Motors via Stator Frequency Variation

Author: stud Mihnea-Ștefan POPA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The variation of the supply frequency of asynchronous motors, also known as speed control of asynchronous motors, is a common and efficient method for achieving optimal motor operation and increasing the efficiency of the drive system in industrial applications. This type of motorized speed control is used to dynamically adjust the motor speed according to the drive system requirements and can enhance its energy efficiency. This project presents asynchronous motors along with their operating principles and focuses on speed control through frequency variation, highlighting the effect of this method on electrical equipment. Additionally, the presentation of frequency converters is detailed, as these devices are essential components — they are the ones that modify the supply voltage into a variable frequency voltage. In this project, asynchronous motors are described along with their operating principles, with special emphasis placed on speed control through frequency variation and the effect of this method on electrical equipment. Furthermore, the presentation of frequency converters is detailed, as these devices are essential components, responsible for modifying the supply voltage into a variable frequency voltage. Moreover, practical applications and relevant examples from various industries are highlighted, demonstrating the advantages of using frequency converters in the food industry, chemical industry, metallurgy, and transportation. According to the analyses conducted, the use of the aforementioned technology will significantly reduce electricity costs, improve the performance of many types of equipment, extend the service life of components, and lower maintenance costs. Finally, relevant conclusions on the effectiveness of the frequency control method are provided, along with its applicability in modern industry, emphasizing its importance in the context of sustainability and improved operating conditions. Recommendations for the implementation and improvement of frequency control systems are offered, along with insights on recent advancements in electrical technologies and future perspectives.*

Keywords: *Asynchronous Motors; Speed Control; Energy Efficiency; Frequency Converter; Industrial Applications; Dynamic Speed Adjustment; Sustainable Operation; Maintenance Cost Reduction*

53. (ID 349) The electric Motor in Electrical Engineering

Authors: stud Roberto-Adrian MARGEAN, stud. Andrei-Alexandru LIXANDRU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this article, we will discuss the impact of electricity quality on the performance, durability, safety, and economic cost of electrical equipment. We will introduce various factors that influence the quality of electrical energy, such as voltage fluctuations, frequency deviations, and harmonic distortions. Additionally, we will explore different technologies and methods that can be utilized to enhance the quality of electrical energy, including active filtering, reactive power compensation, and automation and control systems. Finally, we will conclude with case studies and examples of innovative projects that have effectively improved the quality of electrical energy in various industries, emphasizing the significance of continuous research and development in this field.*

Keywords: *electricity, energy, quality*

54. (ID 350) Wind Turbines

Authors: stud Roberto-Adrian MARGEAN, stud. Andrei-Alexandru LIXANDRU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Wind turbines play a crucial role in the transition to renewable energy by converting wind's kinetic energy into electricity through advanced mechanical and electrical systems. Horizontal-axis turbines dominate due to their high efficiency, while vertical-axis turbines are suited for smaller-scale or urban applications. Offshore turbines, though more expensive, capture consistent oceanic winds and often outperform onshore models located on accessible land. These systems integrate with energy grids using inverters, stabilizers, and reactive power compensation to maintain voltage and frequency stability. Key advantages include clean energy production,*

scalability, and technological maturity. However, challenges remain, such as dependence on weather conditions, high initial costs, and occasional grid disruptions. Hybrid systems that combine wind with solar or energy storage improve reliability, particularly in remote areas. A SWOT analysis reveals strong efficiency and growth potential but highlights regulatory challenges and environmental unpredictability. Ongoing development focuses on optimizing efficiency and integration, reinforcing wind power's role in a sustainable energy future.

Keywords: *Hybrid systems, renewable energy, clean energy*

55. (ID 367) Reducing Pollutant Emissions from Ships Through Updated Measures

Author: stud Miha BIBICU

Scientific Advisor: Lecturer Eng. George NOVAC, PhD.

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Maritime transport is one of the most important components of the global economy, providing over 80% of the volume of international trade. However, this sector contributes significantly to air pollution and climate change, through emissions of carbon dioxide (CO₂), nitrogen oxides (NO_x), sulfur oxides (SO_x) and suspended particles. In the current context of intensifying global efforts to combat climate change, it is essential to reduce the negative impact of maritime transport on the environment. The International Maritime Organization (IMO) has recognized the urgent need to implement effective measures to reduce emissions generated by ships. Through strict regulations and the promotion of innovative technologies, the maritime industry is trying to align itself with the objectives of sustainability and ecological transition. This paper aims to analyze in detail the major sources of pollutant emissions from maritime transport, to present current international regulations, as well as recent technological and operational measures that contribute to reducing pollution. Relevant case studies will also be discussed and suggestions will be offered on future directions of action for a greener and more sustainable maritime industry.*

Keywords: *sustainable, reducing pollution, effective measures*

56. (ID 370) Azipod Propulsion System

Authors: stud Raluca-Ștefania DEPEȚEANU, stud. Andrei COSÎTEANU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The AZIPOD propulsion system represents a modern and efficient approach for ships, combining propulsion and steering functions in a rotary module placed beneath the ship's hull. It includes a high-power electric motor that directly drives one or two propellers and allows rotation of up to 360°, providing superior maneuverability. The advantages include reduced fuel consumption, noise, and vibrations, saved space on board, and reduced maintenance. Due to its high hydrodynamic efficiency, the AZIPOD system is used on passenger ships, tankers, icebreakers, and bulk carriers, marking a significant advancement in the maritime field.*

Keywords: AZIPOD, Propulsion System, 360° rotation

57. (ID 383) Electromagnetic Compatibility Assessment Aboard a Military Vessel

Author: stud Eduard-Constantin ȘTEFAN

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project analyzes electromagnetic compatibility (EMC) aboard a military vessel, focusing on the main sources of interference and their impact on onboard electronic equipment and crew health. The study includes measurements of radiated electromagnetic power flux density, compared against both military and civilian standards, with the aim of developing an electromagnetic map of the ship. Based on the findings, effective counter-interference solutions are proposed to enhance system functionality and ensure operational safety under various ship operating conditions.*

Keywords: Electromagnetic Compatibility, Military Vessel, Interference, Power Flux Density

58. (ID 384) Renewable Energy Systems for Electricity Generation in Seaports

Authors: stud Ionut-Cristian ILIE, stud. Robert Ionut SIPICA

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The integration of renewable energy systems in seaports is a key step toward a more sustainable and energy-efficient port sector. This study analyzes the main renewable sources applicable in port environments such as solar, wind, wave, and tidal energy highlighting their potential based on specific geographic and climatic conditions. Hybrid solutions and the role of energy storage in improving system reliability are also explored. Implementing these technologies contributes to reducing carbon emissions, lowering operational costs, and creating a cleaner environment in port areas. The paper also emphasizes the technical, economic, and regulatory challenges that must be overcome for widespread adoption. By presenting relevant case studies and international best practices, the study outlines a clear vision for the green future of maritime ports.*

Keywords: *Renewable Energy Systems for Electricity Generation in Seaports*

59. (ID 392) Identification of Electric Motor Faults Using Noise Analysis

Authors: stud Robert Ionuț SIPICA, stud. Cristian Ionuț ILIE

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The proper functioning of electric motors is essential in various industrial and domestic applications. Identifying faults at an early stage can prevent costly downtimes and equipment damage. This paper focuses on the detection of electric motor problems through noise analysis, a non-invasive and effective diagnostic method. By analyzing the acoustic signals emitted during operation, it is possible to detect anomalies related to mechanical or electrical issues such as bearing defects, misalignment, or rotor imbalance. The study presents the principles of noise-based diagnostics, common fault types, and signal processing techniques such as FFT (Fast Fourier Transform). This method offers significant advantages in predictive maintenance and can be enhanced using modern technologies like machine learning and IoT.*

Keywords: *Electric Motor, Noise Analysis, Fault detection, noise identification, motor diagnostics, acoustic signals*

60. (ID 393) Carbon Footprint on Passenger Ships

Author: stud Ștefan Andrei MIREA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Passenger ships contribute significantly to greenhouse gas emissions due to their reliance on fossil fuels and high energy consumption. The carbon footprint of these vessels is influenced by factors such as ship size, fuel type, operational efficiency, and route length. As global awareness of climate change grows, there is increasing pressure on the maritime industry to adopt greener technologies. Efforts include the use of alternative fuels, hybrid propulsion systems, and improved hull designs to reduce emissions. Accurate carbon footprint assessments are essential for developing sustainable strategies and meeting international environmental regulations.*

Keywords: *carbon footprint, passenger ships, propulsion, environmental, fuel*

61. (ID 394) Electric Propulsion on Passenger Ships

Author: stud Ștefan Andrei MIREA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Electric propulsion is emerging as a sustainable alternative for passenger ships, aiming to reduce reliance on fossil fuels and lower greenhouse gas emissions. By using batteries or hybrid systems, electric-powered vessels can operate more quietly and efficiently, especially on short routes. This technology not only minimizes the carbon footprint but also improves air quality in port areas. While challenges remain such as limited battery capacity and infrastructure needs ongoing advancements make electric propulsion a promising solution for greener maritime transport.*

Keywords: *electric, gas, batteries, maritime transport, propulsion*

62. (ID 400) CyberWing

Author: stud Bianca BADEA

Institution: "Nicolae Bălcescu" Land Forces Academy, Sibiu

Abstract: *CyberWing represents a revolution in military drone technology, combining the natural stealth of an owl with artificial intelligence and advanced surveillance systems. Designed for tactical reconnaissance operations, this biomimetic drone perfectly mimics the appearance and flight of a bird of prey, allowing discreet infiltration into areas of interest without drawing attention. Its advanced propulsion system includes flapping wings for natural flight and a silent gliding mode, reducing both acoustic and visual signatures. Equipped with state-of-the-art AI and advanced sensors, CyberWing can identify targets, avoid obstacles, and transmit critical information in real-time. Control is managed by a Pixhawk 4 or Kakute F7, providing exceptional maneuvering precision. The high-resolution FPV camera and uBlox GPS system enable autonomous navigation and programmed patrols. Additionally, retractable claws allow for strategic landings and discreet sample collection. CyberWing redefines aerial espionage and military reconnaissance, offering an invisible, versatile, and highly effective solution for special operations. It is the perfect weapon for advanced surveillance, delivering unprecedented tactical superiority.*

Keywords: *advanced reconnaissance, AI, biomimetic, military drone, stealth surveillance*

63. (ID 409) Modeling and Simulation of the Cooling and Air Conditioning System Onboard of a Maritime Cargo Ship

Authors: stud Ionut Alin POPA, stud. Eduard Andrei URSOI

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Brief overview of the purpose, methodology, simulation tools, and main findings.*

Keywords: *Modeling and Simulation*

64. (ID 410) Calculating the Reliability of the Navigation System on Board a Shipping Vessel

Authors: stud Eduard Andrei URSOI, stud. Ionut Alin POPICA

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The reliability of the navigation system onboard a shipping vessel is critical to ensuring safe and efficient maritime operations.*

This study focuses on evaluating and quantifying the reliability of key components within the integrated navigation system, including GPS, radar, gyrocompass, AIS, and electronic chart display and information systems (ECDIS). A systems engineering approach is employed, incorporating fault tree analysis (FTA) and failure mode and effects analysis (FMEA) to identify potential failure points and their impact on overall system performance. Reliability block diagrams (RBD) are used to model the interdependencies of components and calculate the system's mean time between failures (MTBF) and overall reliability over a defined operational period. The results highlight the most vulnerable subsystems and suggest redundancy strategies and preventive maintenance measures to enhance system robustness. The findings contribute to improved navigational safety, reduced downtime, and compliance with international maritime safety standards.

Keywords: *calculating the reliability*

65. (ID 416) Magnetic Anomalies in the Romanian Black Sea Litoral Area

Authors: stud Maria-Denisa BULGARU, stud. Alexia-Elena ONOFREI

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The detection, localization and identification of underwater objects - shipwrecks, mines, geological structures - is an important objective of the Romanian Naval Forces, both in peacetime and in case of conflict. An essential method in this respect is the analysis of magnetic anomalies, which are caused by the deformation of the terrestrial magnetic field by objects with magnetic properties. The Surlari National Geomagnetic Observatory contributes relevant data. Moreover, national projects, such as the 2006 project coordinated by ROSA, have enabled the development of specialized instruments such as the Overhauser magnetometer. Detailed measurements have been carried out in the Black Sea, complemented by geophysical maps showing tectonic structures and differences between continental and oceanic crust. Proton and fluxgate magnetometers are commonly used, although measurements can be affected by various noise sources. Identifying and mapping magnetic*

anomalies is vital for maritime safety and understanding marine geology.

66. (ID 429) Adopting the Optimal Solution Regarding the Geometric Shape of The Electrical Circuits in The Global and Local Compensation Windings Component

Authors: stud Camelia-Georgiana ION, stud. Denisa ROȘU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper presents a technical approach for optimizing the geometric configuration of electrical circuits used in global and local magnetic compensation windings, with direct application in marine environments. The analysis includes a comparative evaluation of design variants based on their magnetic properties and efficiency in generating a stable compensating field. The study aims to identify the most effective circuit layout to minimize magnetic disturbances and enhance the precision of navigation systems on board. The proposed solutions are grounded in theoretical modeling and practical implementation considerations relevant to modern electrical engineering challenges in maritime technology.*

Keywords: *magnetic compensation, electrical windings, field optimization, geometric configuration, marine electrical systems*

67. (ID 431) Alternative Energy Sources in Naval Transport: Focus on Solar Cells

Authors: stud Andrei Denis SÂRBU, stud. Georgiana Elena POPA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study explores the use of photovoltaic cells as a sustainable energy solution in naval transportation. We present the fundamental principles of solar radiation and photovoltaic conversion, as well as the structure, types, and parameters of photovoltaic cells and modules. The study emphasizes the benefits and limitations of using solar energy at sea and discusses the practical aspects of implementing solar systems on ships or isolated maritime platforms.*

Keywords: *photovoltaic, naval transportation*

68. (ID 438) The Effect of the Electromagnetic Field on the Human Body

Author: stud Andrei-Tiberiu NIȚĂ

Scientific Advisor: Prof. Samoilescu GHEORGHE, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *In the work I did, I talked about the electromagnetic effect on the human body and the problems it creates.*

69. (ID 449) "Dams: A Key Element in Energy and Navigation Systems"

Author: stud Assoc. Elena-Isabela CHELARU

Scientific Advisor: Assoc. Prof. Andreea CÎRCIUMARU, PhD

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *The choice of dams as a subject stem from their critical role in modern infrastructure, particularly from an electrical perspective. Dams are unique in serving both as major producers of renewable energy through hydroelectric power generation and as significant consumers during construction, operation, and maintenance phases. Beyond their electrical impact, dams also facilitate navigation by regulating river flow and creating stable water channels, supporting commerce and transportation. Historically, dams have evolved from simple river barriers to highly sophisticated structures, integrating advanced engineering techniques and technologies. Today's dams encompass complex systems including turbines, generators, transformers, and control units, all of which are crucial for efficient energy management. Understanding the technical composition of dams offers valuable insights into sustainable development, grid stability, and environmental impact, making them a subject of high relevance and multidisciplinary interest for researchers and engineers alike.*

Keywords: *Historical Development, Energy Consumption, Navigation Support, Renewable Energy, Hydropower*

70. (ID 464) Safety Improvements of Standard Industrial Robots for Close-Proximity Operations

Author: stud Andrei Valeriu COȘA

Scientific Advisor: Assoc. prof. Carlos-Mihai PASCAL, PhD

Institution: "Gheorghe Asachi" Technical University of Iași

Abstract: *This paper presents an approach to overcoming the safety limitations of industrial robots in human-robot collaboration tasks. Nowadays, technology enables the development of avoidance systems or mechanisms that allow slight collisions to prevent severe injuries caused by robots. This capability will enable the transition to collaborative robotic systems, which are required by many companies seeking flexibility to enhance product customization using existing industrial robots. Our research is based on a system of sensors attached to the robotic arm to sense the human impact. The presented reaction system uses a decentralized wireless network built with ESP32 microcontrollers and other off-the-shelf components. The safety concern covers the entire system's reaction time, from the sensing to the robot's emergency stop. The results obtained from the prototyped system highlight the feasibility of building a protection system under certain conditions.*

Keywords: *robotics, industrial safety, sensors, wireless networks, microcontrollers*

71. (ID 482) Renewable Energy-Powered Wireless Charging Base for Autonomous Vehicles

Author: stud Alin ENACHE

Scientific Advisor: Lecturer eng. Vlad MOCANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the development of a wireless charging base powered by a renewable energy source, specifically designed for autonomous vehicles. With the growing demand for sustainable transportation and the rapid evolution of autonomous systems, integrating wireless power transfer (WPT) with renewable energy presents a promising solution for efficient and environmentally friendly charging infrastructure. The study begins with an overview of the current state of wireless energy transfer technologies, highlighting key advancements in inductive and resonant coupling methods. Maximum efficiencies reported in recent research have reached over 90% for short distances (under 20 cm), while mid-range systems have demonstrated effective power transfer over distances up to 30–50 cm with efficiencies between 70–85%, depending on alignment and frequency. Charging power levels range from a few kilowatts to over 100 kW, sufficient for electric*

autonomous vehicles (AVs) such as delivery robots, shuttles, or drones. The integration of photovoltaic or wind energy as the primary power source for the wireless charging station ensures off-grid capability and reduces the carbon footprint. This paper evaluates system architectures, energy management strategies, and practical challenges in implementing such a system in urban and remote environments. The proposed solution contributes to the advancement of smart, sustainable infrastructure for the future of autonomous mobility.

Keywords: *Wireless Power Transfer (WPT), Autonomous Vehicles, Renewable Energy, Inductive Charging, Resonant Coupling, Smart Infrastructure, Off-grid Charging, Energy Efficiency, Sustainable Transportation, Electric Vehicles (EVs)*

72. (ID 483) Power Below the Surface: Simulating a Renewable Wireless Charging Base for Underwater Autonomous Vehicles

Author: stud Alin ENACHE

Scientific Advisor: Lecturer eng. Vlad MOCANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This study presents the simulation and analysis of a renewable energy-powered wireless charging base for underwater autonomous vehicles, focusing on the efficiency of magnetic coupling between two loop coils. The experiment is conducted in ANSYS Electromagnetics, where two circular coils are placed in a seawater environment at variable distances ranging from 1 mm to 125 mm equal to the diameter of the coils. The frequency range spans from 10 kHz to 200 kHz, targeting the optimal balance between power transfer efficiency and electromagnetic compatibility in underwater conditions. The objective is to evaluate how coil separation and operating frequency affect the mutual inductance and energy transfer capability in a lossy medium such as seawater. This work contributes to the design of efficient, renewable, wireless charging systems for autonomous underwater vehicles (AUVs), supporting sustainable and autonomous maritime operations.*

Keywords: *Wireless Power Transfer (WPT), Loop Coil, Underwater Charging, Autonomous Underwater Vehicles (AUVs), Renewable Energy, Magnetic Coupling, Seawater, ANSYS Electromagnetics, Mutual Inductance, Frequency Sweep, Coil Separation*

73. (ID 485) Modeling of An Integrated Reconfigurable Intelligent System (Iris) For Ship Design

Author: stud Denis Gabriel GÎRBĂCEA

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The Georgia Institute of Technology Aerospace Systems Design Laboratory (ASDL) is helping the Navy change its design practices to achieve reduced total ownership costs, increased survivability, and increased mission effectiveness through an initiative called Integrated. Reconfigurable Intelligent Systems (IRIS). Using traditional systems engineering practices for the early design process followed by an integrated design environment, IRIS seeks to shift ship design to a distributed, intelligent control architecture through increased automation.*

74. (ID 489) Assessment of Electromagnetic Field Penetration in the Human Body

Author: stud Mihai-Alexandru NEDELCU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project investigates the penetration of electromagnetic (EM) fields into the human body through modeling and experimental measurements. The study focuses on estimating key parameters such as electric field intensity, specific absorption rate (SAR), power density, and temperature variation in various tissues. Based on biological dielectric properties and frequency-dependent behavior, simulations and data from scientific literature were used to evaluate field distribution and energy absorption in organs such as the brain, muscles, and liver. The research differentiates between chronic low-level exposures common in domestic or naval environments and acute high-intensity exposures encountered in occupational settings. Both types of exposure can lead to thermal and non-thermal biological effects, including disruptions in hormonal balance and increased cancer risk. International safety standards, such as those from IEEE and ICNIRP, are discussed in the context of permissible exposure limits and risk mitigation. The results highlight the importance of continuous monitoring, shielding solutions, and*

personnel training in EM-exposed environments. Additionally, the study emphasizes the need to update current regulations to consider non-thermal effects and support long-term health protection.

Keywords: *Electromagnetic field (EM) penetration, Specific Absorption Rate (SAR), Thermal and non-thermal effects, biological tissue modeling, Exposure safety standards (IEEE, ICNIRP)*

75. (ID 492) Veitch-Karnaugh Diagrama

Authors: stud Carmen-Elena LAZĂR, stud. Eduard-Florian IVAN

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Our presentation is about Veitch-Karnaugh diagrams, which are graphical tools simplifying logic functions using gray code. They aid in minimizing Boolean expressions for efficient circuit implementation. While user-friendly, they're limited by the number of variables. These diagrams are valuable for digital logic design and cost-effective system.*

Keywords: *Veitch-Karnaugh diagram, Boolean algebra, Veitch chart*

76. (ID 115) Study on The Automatic Control of Two Electric Motors

Authors: stud Andrei-Rares CHIRIAC, stud. George-Viorel PĂUNA

Scientific Advisor: S.L.dr.ing. Leon PANĂ

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Sequential automatic three-phase motor drives are discussed in this paper, with emphasis on power controls as well as motor sequencing, programmable logic controllers (PLCs), and wiring diagrams. Electromechanical devices as well as PLC-based logic (Siemens LOGO!) are applied in the planned control system for the sake of safe, efficient sequential motor drive. Devices such as contactors, timers, and thermal overloads are discussed with their applications in ensuring sequencing of motors, safety of operations, as well as efficiency in performance. Examples in conveyor systems, pumping systems, HVAC, as well as in industrial drives illustrate the practicability of sequential motor drive. An experimental circuit demonstrates sequential starting of motors utilizing protective devices for the sake of demonstrating reliability, flexibility, as well as enhanced safety in motor drive systems.*

Keywords: *Three-phase motors, Sequential control, Siemens LOGO! PLC, Timers, Industrial automation, Electric circuits, Experimental setup.*

77. (ID 116) Production of Unconventional Energies: Comparative Study Between "Wind Energy, Photovoltaic and Hydrogen" Energy

Author: stud Andrei-Rares LUPUSOR

Scientific Advisors: Assoc. Prof. Rita AVRAM, PhD, SR3 eng. Radu MANU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The transition towards renewable energy sources is critical in addressing the challenges of climate change and energy sustainability. This study provides a comparative analysis of three unconventional energy sources: wind energy, photovoltaic (solar) energy, and hydrogen energy. Each of these energy technologies is evaluated based on key parameters such as efficiency, environmental impact, scalability, economic feasibility, and technological advancements. Wind energy and photovoltaic systems are examined for their established roles in global energy markets, with a focus on their integration into power grids, land usage, and cost dynamics. Hydrogen energy, as a promising future technology, is explored in terms of its potential for decarbonizing various sectors, including transportation and industry, alongside challenges such as storage and infrastructure development. The comparative study highlights the strengths and limitations of each energy source, offering insights into their current and future roles in the global energy transition. Ultimately, the findings suggest that while each energy technology has distinct advantages and challenges, a hybrid approach, integrating multiple renewable sources, may provide the most effective path toward a sustainable energy future.*

Keywords: *comparative study, wind energy, photovoltaic, hydrogen energy*

78. (ID 122) Analysis of the Induction Motor Regimes Used on Maritime Vessels

Authors: stud Andreea-Ysabela TRUTESCU, stud. AnaMaria-Raluca RISTACHE

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Military and civilian ships have equipment and mechanisms within the naval electrical power system, powered by electric machines.*

Asynchronous machines are the most commonly used electric machines. They can operate as motors, generators, or electromagnetic brakes.

In motor mode, the asynchronous machine converts the electrical power received from the grid into mechanical power, which is transmitted to the shaft of a mechanical installation. In generator mode, the machine converts the mechanical power received at the shaft from a drive motor into electrical power output into an alternating current grid. In braking mode, the asynchronous machine receives mechanical power at the shaft and electrical power from the electrical grid, which it transforms into heat through the Joule-Lenz effect, generating the torque needed to brake a mechanism.

The electromagnetic braking mode is used in special, short-duration cases. Rotor currents increase rapidly in amplitude and frequency, reaching a saturation value determined by the physical properties of the rotor circuit. The electromagnetic braking torque decreases as the direction of rotation of the rotor reverses and as its speed accelerates in the negative direction.

As for applicability on ships, the asynchronous machine, used as an electromagnetic brake, is employed in the charging system, cranes, and winches.

Keywords: *Asynchronous machines, motor mode, generator mode, electromagnetic braking mode*

79. (ID 126) Rules for Installing Level Transducers on Board Ships

Authors: stud Radu-Mihai RUSU, stud. Răzvan-Gabriel RUSU, stud. Ștefan-Matei GANĂ

Scientific Advisor: Lecturer eng. Iancu CIOCIOI, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation, "Rules for Installing Level Transducers on Board Ships," summarizes best practices for safely installing, wiring, adjusting, and maintaining level transducers in marine*

environments. Using examples such as capacitive sensors to illustrate universal guidelines, it ensures accurate fluid monitoring and regulatory compliance onboard vessels.

Keywords: *Level Transducers*

80. (ID 135) Integration of ATEX Electrical Systems with Ship Control and Automation Systems

Authors: stud Alexandru-Florin RISTEA, stud. Andrei Alexandru DAN

Scientific Advisor: Assoc. Prof. Florentiu DELIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The paper presents ATEX-type electrical systems designed to ensure the safe operation of equipment in explosive atmospheres, in compliance with European Union directives. ATEX directives provide guidelines for the classification of hazardous areas, equipment selection, and installation and maintenance procedures to prevent ignition sources and minimize explosion risks. This allows organizations to protect people, equipment, and the environment while ensuring compliance with regulatory requirements.*

Keywords: *Atex, Electrical Systems*

81. (ID 136) Reliability Calculation of the Propulsion System on Board a Maritime Transport Vessel

Authors: stud Emrin OMER, stud. Casian-Filip STRATULAT

Scientific Advisor: Lecturer Paul VASILIU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The propulsion system is a critical component in the operation of any maritime transport vessel, directly impacting navigational safety, operational efficiency, and maintenance costs. This paper presents an analysis of the reliability of the ship's propulsion system by identifying the main failure modes, evaluating key reliability indicators such as Mean Time Between Failures (MTBF), and applying statistical methods to assess system performance over time. The study also explores preventive and corrective maintenance strategies aimed at increasing system availability and reducing the risk of unexpected breakdowns. The results offer valuable insights into optimizing the operation and*

maintenance of propulsion systems in maritime vessels, contributing to increased efficiency and reduced downtime in maritime transport.

Keywords: *"Reliability Calculation Propulsion"*

82. (ID 137) Study on The Use of Doppler Sounder on Board Ships

Authors: stud. Casian-Filip STRATULAT, stud. Emrin OMER,

Scientific Advisor: Lecturer Eduard DRAGOMIR, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Study on the Use of Doppler Sounder Onboard Ships*

The Doppler sounder is an essential tool for modern maritime navigation and seabed mapping. This study explores its applications, advantages, and limitations in shipborne operations. By utilizing the Doppler effect, these sounders provide accurate depth measurements and velocity data, improving navigational safety and efficiency. The paper examines the integration of Doppler technology with other onboard systems, analyzing its impact on real-time decision-making. Key challenges, such as signal interference and environmental factors, are also discussed. The study concludes that Doppler sounders enhance maritime operations by providing precise and reliable hydrological data, making them indispensable for modern shipping.

Keywords: *Doppler, sounder*

83. (ID 139) Considerations Regarding the Use of Digital Pressure Transmitters in Automation Schemes on an LPG Vessel

Authors: stud Erol Gazi, stud. Alexandru Frangu

Scientific Advisors: Captain Assoc. Prof. Eng. Paul BURLACU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Digital pressure transmitters play a crucial role in the automation systems of LPG vessels, ensuring safe and efficient operation. These devices provide accurate, real-time pressure readings that are essential for monitoring and controlling cargo handling and propulsion systems. Their integration into automation schemes enhances system reliability and reduces human error. Unlike analog transmitters, digital models offer improved signal processing, diagnostics, and communication via protocols like HART*

or Modbus. They also support predictive maintenance by detecting early signs of malfunction. On LPG vessels, where pressure control is vital for safety, digital transmitters help maintain stability in pressurized tanks and pipelines. Their use facilitates better data logging and remote monitoring. Overall, they contribute to operational safety, efficiency, and compliance with maritime regulations. Careful selection, calibration, and regular maintenance are essential to ensure optimal performance.

Keywords: *Digital Pressure Transmitters, Automation Schemes*

84. (ID 144) Preparing the Energy Balance and Choosing the Dg Group for A Container Ship.

Authors: stud Dragos-Alexandru BURGHELEA, stud. Stefan MOSOIANU

Scientific Advisors: Captain Assoc. Prof. Eng. Paul BURLACU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Preparation of the Energy Balance and Selection of the Diesel Generator (DG) Unit on a Container Ship. The energy balance of a container ship involves calculating all power demands during various operating conditions. This includes propulsion, cargo handling systems, lighting, HVAC, and auxiliary services. Accurate energy balance helps optimize fuel consumption and improve efficiency. The diesel generator group is chosen based on peak and continuous power requirements. Redundancy and safety regulations are key considerations in the selection process. Environmental standards also influence the type and number of generators installed. The generator's load factor and operational flexibility must be evaluated. Proper sizing ensures reliable operation without overloading or underutilization. A well-designed system supports smooth operation and cost-effective performance.*

Keywords: *energy balance, DG group*

85. (ID 145) Analysis and Implementation of Vector Control Methods for Three-Phase Asynchronous Motors in Naval Electrical Systems.

Authors: stud Stefan MOSOIANU, stud. Dragos-Alexandru BURGHELEA

Scientific Advisor: Assoc. Prof. Florentiu DELIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Vector control is a modern technique for controlling the torque and speed of AC motors with high precision. In marine systems, three-phase asynchronous motors are widely used due to their reliability and efficiency. Implementing vector control improves dynamic performance and energy efficiency. The method decouples torque and flux, enabling control similar to DC motors. Sensor-based and sensorless control strategies are analyzed for different applications. Marine environments demand robust and fault-tolerant control systems. Integration with automation and monitoring systems enhances operational flexibility. Simulation and real-time testing validate the control algorithms. Optimized vector control reduces wear, energy consumption, and maintenance costs.*

Keywords: *vector control, three-phase asynchronous motors, naval electrical systems*

86. (ID 152) Analysis of the Selectivity of Protections on Board a Ship

Authors: stud David CACENCU, stud. Raul RUSU

Scientific Advisor: Lecturer Leon PANĂ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper focuses on low voltage selectivity using ABB circuit breakers, aiming to provide a detailed guide for the effective protection of electrical installations. Importance of selectivity: Selectivity is essential for safety and minimizing interruptions, being regulated by standards such as CEI 64-8. It can be:*

Total: When only the load circuit breaker trips.

Partial: Allowing certain faults without tripping.

Selectivity techniques analyzed:

Time-current: Time-current selectivity guarantees that the load circuit breakers will trip faster than the supply circuit breakers, preventing overlap. This depends on the tripping characteristics, setting minimum and maximum values for the intervention current.

Energy: This technique allows the coordination of current-limiting circuit breakers, reducing short-circuit peaks and protecting equipment.

Zone: Zone selectivity improves rapid fault identification and reduces tripping times below 100 ms, limiting damage and thermal stress on components.

Protection coordination:

Correct coordination of ABB circuit breakers, using manufacturer tables and calculated values, ensures continuous service and effective protection of electrical installations.

87. (ID 153) Decarbonization Solutions in Maritime Transport

Authors: stud Alexandru-Daniel SPIRU, stud. Sebastian-Valentin PARMAC

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Maritime transport is a critical sector for global trade, yet it remains one of the largest sources of greenhouse gas emissions. As the world faces growing climate challenges and stringent regulations, decarbonizing this sector has become a priority. This abstract explores a range of innovative solutions and emerging technologies aimed at reducing CO₂ and other pollutant emissions in maritime transport. These solutions include the use of alternative fuels such as green hydrogen and ammonia, the implementation of carbon capture and storage (CCS) technologies, and the development of vessels powered by electric propulsion or fuel cells. Furthermore, improving energy efficiency through optimized ship designs and hybrid propulsion systems can significantly lower fuel consumption. Route optimization and energy management systems also play a crucial role in reducing fuel usage. Integrated approaches, combining multiple technologies and strategies, are essential for achieving decarbonization targets set by international agreements like the Paris Agreement. The successful implementation of these solutions will require close collaboration among authorities, the maritime industry, and researchers to develop policies and infrastructure that support the transition to a greener maritime sector.*

Keywords: *Decarbonization, Maritime, Emission reduction*

88. (ID 154) Optimizing Maritime Transport through AI, Autonomous Systems, and Green Technologies

Authors: stud Sebastian-Valentin PARMAC, stud. Alexandru-Daniel SPIRU

Scientific Advisor: SR3 eng. Radu MANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The maritime transport industry plays a pivotal role in global trade, but it faces challenges related to efficiency, safety, and environmental sustainability. This paper explores the potential of integrating Artificial Intelligence (AI), autonomous systems, and green technologies to optimize maritime operations. AI-driven systems can enhance route planning, predictive maintenance, and operational efficiency by processing vast amounts of data, reducing human error, and improving decision-making in real-time. Autonomous vessels, equipped with advanced sensors and AI, offer the potential to reduce crew-related costs, enhance safety, and decrease human-related accidents. Additionally, the adoption of green technologies, such as renewable energy sources, energy-efficient hull designs, and emission-reducing technologies, is crucial for reducing the environmental impact of maritime transport. This paper discusses the synergies between these innovations, examining how they can drive sustainability and performance improvements in the industry. The paper also highlights challenges such as regulatory hurdles, high initial investment costs, and the need for robust cybersecurity measures, while emphasizing the long-term benefits of these advancements in fostering a more efficient, safe, and environmentally-friendly maritime sector.*

Keywords: *Autonomous Systems, and Green Technologies, AI*

89. (ID 157) Implementation of IoT Technologies for Real-Time Monitoring of ATEX Equipment

Authors: stud Codrin GÎLCĂ, stud. Andrei DOȘCU

Scientific Advisor: Assoc. Prof. Florentiu DELIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In this paper, we study the integration of Internet of Things (IoT) technologies for real-time monitoring of ATEX-certified equipment used on board ships. The focus is on developing a monitoring system capable of collecting, transmitting, and analyzing*

data from hazardous areas. The sensors used are certified for explosive atmospheres and measure parameters such as temperature, pressure, vibrations, and gas concentration. The collected data is sent through secure communication protocols like LoRaWAN, ZigBee or LTE to cloud platforms including AWS IoT and Google Cloud IoT Core. The system supports predictive maintenance through anomaly detection algorithms based on machine learning models. The implementation also includes cybersecurity measures aligned with Maritime 4.0 standards. The conclusions of this paper show that IoT solutions can significantly improve operational safety and maintenance efficiency of ATEX equipment. By using intelligent sensors and real-time analysis, risks can be minimized and compliance with international safety standards ensured.

Keywords: *Internet of Things (IoT), ATEX-certified equipment*

90. (ID 171) Analyzing the Negative Effects of Electromagnetic Disturbances

Authors: stud Alexandra BALAN, stud. Ionut BALAN

Scientific Advisors: Prof. Gheorghe SAMOILESCU, PhD, Lecturer Florin POSTOLACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper explores the negative effects of electromagnetic disturbances (EMDs) on modern electronic and communication systems. Electromagnetic interference (EMI) and electromagnetic pulses (EMP) can disrupt critical operations, degrade signal integrity, and cause permanent damage to sensitive equipment. The analysis highlights both natural sources, such as solar flares, and man-made origins, including military-grade EMP weapons and industrial machinery. Emphasis is placed on the vulnerability of navigation, control, and data transmission systems in high-stakes environments like aerospace, defense, and maritime sectors. Mitigation strategies such as shielding, grounding, and the use of filters are also discussed, underlining the importance of proactive electromagnetic compatibility (EMC) practices in system design and maintenance.*

Keywords: *Analyzing the negative effects of electromagnetic disturbances*

91. (ID 173) Analysis of Protection Selectivity on Board A Vessel

Authors: stud David CACENCU, stud. Raul RUSU

Scientific Advisor: Lecturer Leon PANĂ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The main subject of this project is low-voltage selectivity using ABB circuit breakers, providing a detailed guide for effective electrical protection of installations.*

Importance of selectivity: Selectivity is crucial for safety and minimizing disruptions, regulated by standards like CEI 64-8. It can be:

Total: When only the load-side breaker trips.

Partial: Allowing certain faults without triggering upstream devices.

Selectivity techniques analyzed:

Time-current: Time-current selectivity ensures that load-side breakers trip faster than supply-side breakers, preventing overlap. It depends on trip characteristics, setting minimum and maximum intervention current values.

Energy: This technique allows coordination of current-limiting breakers, reducing short-circuit peaks and protecting equipment.

Zone: Zone selectivity enhances fault identification and reduces trip times to below 100 ms, minimizing damage and thermal stress on components.

Protection coordination:

Proper coordination of ABB circuit breakers, using manufacturer tables and calculated values, ensures continuous service and efficient protection of electrical installations.

92. (ID 174) Study on Motor Control Using Microcontrollers Onboard Ships

Authors: stud Daniel-Petre TURLICA, stud. Nicola Sorin COTEANU

Scientific Advisor: Lecturer Eduard DRAGOMIR, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper analyzes the use of microcontrollers in marine engine control systems, highlighting their advantages in terms of precision, energy efficiency and process automation. The study explores different microcontroller architectures, motor control methods and their integration into propulsion and auxiliary systems*

onboard ships. Both theoretical aspects and practical applications are presented, offering an overview of how modern technology contributes to the optimization of shipboard machinery operation.

Keywords: motor; microcontrollers; ship

V. SECTION: WEAPONS AND COMMUNICATIONS

Section Committee:

Chairman: LCDR Assoc. prof. Ovidiu CRISTEA, PhD

Members: Lecturer Gheorghe ICHIMOAEI, PhD

Lieutenant jg. Silviu POPA, PhD candidate

Stud. Alexandru-Marian BARBU

Stud. Ovidiu-Andrei BOALCĂ

Stud. Irina-Elena AXINTE

Stud. Alexia-Mădălina IOSIF

Room LI125

1. (ID 14) Communication Methods used in Organizations

Authors: stud. Vasilica-Daniela REBEGEA, stud. Ion GHENCUI

Scientific Advisors: Lecturer Daniel DANECI PATRAU, PhD

Institution: Maritime University Constanta

Abstract: *In any economic organization, people are interdependent, as individual performance affects and is affected by the performance of others. Interdependence requires the coordination of activities by providing the means that will lead to the achievement of the organization's objectives, and coordination involves communication. In the context of the accelerated growth of the increasingly efficient use of electronic means in the field of information, the nature, content and manner of achieving managerial and interpersonal relationships are changing. This article presents some of the typical problems faced by the management of an organization and the three methods of communication: written, verbal and electronic.*

Keywords: *management, communication, organization, managerial hierarchy*

2. (ID 29) Telemedicine in Combat Zones: Advances in Military Healthcare

Author: stud. Iliyana YORDANOVA

Scientific Advisors: Major Konstantin DIMITROV

Institution: Nikola Vaptsarov Naval Academy

Abstract: *Introduction: Telemedicine, the use of telecommunication technologies to provide healthcare remotely, has become a crucial advancement in military healthcare, particularly in combat zones. In the demanding and fast-paced environment of military operations, the ability to deliver timely and efficient medical care is essential. Telemedicine addresses many challenges faced by healthcare providers in these settings, including limited access to specialized medical personnel and facilities. Purpose: The purpose of this study is to explore the application and benefits of telemedicine in combat zones, focusing on its role in enhancing healthcare delivery to soldiers in remote and dangerous environments. This paper aims to evaluate how telemedicine contributes to faster diagnosis, treatment, and decision-making during combat operations.*

Keywords: *Telemedicine, Combat zones, Military healthcare, Remote consultations, medical technology*

3. (ID 62) Weapons and Communications

Author: stud. Bogdan GRIGORE

Scientific Advisors: Lieutenant jg. Silviu POPA

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Weapons and communications are closely linked in modern military operations. Military communications rely on advanced communication technology to ensure secure, reliable, and real-time exchanges of information. Secure communication systems, such as encrypted channels, are vital for protecting sensitive data during combat. Satellite communication plays a crucial role in maintaining global connectivity and coordination, while radio communication remains essential for tactical coordination on the battlefield. Together, these technologies enable efficient command and control, supporting the effective deployment and operation of weapon systems.*

Keywords: *Military communications, Communication technology, Secure communication systems, Satellite communication, Radio communication*

4. (ID 64) Autonomous vehicles: The importance of unmanned systems in mine warfare

Author: stud. Maria-Ramona ENACHE

Scientific Advisors: LCDR Assoc. prof. Ovidiu CRISTEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Autonomous vehicles (AVs) have been developed as an innovative technology with a strong impact on the civilian environment as well as the military field. Their mode of operation without direct human intervention is based on a series of inputs from different advanced sensors, artificial intelligence and varied algorithms in order to carry out the programmed course and perform their tasks autonomously. In recent times, these vehicles have evolved significantly, starting from simple robotic systems to modernized vehicles, capable of making important decisions in various unfavorable circumstances. An important category of autonomous vehicles is the Autonomous Underwater Vehicles (AUV), which have made considerable progress in their development and use. The importance of AUVs lies in the ability to carry out various operations with a high degree of risk while significantly reducing production costs.*

Keywords: *Autonomous Vehicles, Marine, Drones, SeaFox, War*

5. (ID 236) Drone Hijack: Exploiting RF Vulnerabilities Through Adaptive Frequency Jamming

Authors: stud. Bogdan DOBROTA, stud. Robert-Sebastian POPA

Scientific Advisors: LCDR Assoc. prof. Ovidiu CRISTEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This project presents the implementation and testing of a countermeasure system for commercial drones, using a two-stage approach of scanning and electronic jamming. The proposed system consists of two HackRF One device configured to operate in tandem: the first device scans and identifies the frequencies used by the drone for video transmission and control, while the second generates and transmits directed white noise on the identified frequencies. The analysis demonstrates the inherent vulnerabilities of commercial drone systems to RF interference, highlighting two main attack vectors: disruption of video transmission and compromise of RC control signals. The methodology includes a practical implementation using GNU Radio and a live demonstration of the jamming effects on drone functionality. The study is preceded by a conceptual analysis of electronic jamming techniques, including*

relevant case studies such as key fob replay attacks and GNSS spoofing. The research results emphasize the importance of developing more RF-interference resistant drone systems in critical applications and provide perspectives for improving security in wireless communications of unmanned aerial systems.

Keywords: Drone, Security, RF jamming, HackRF, Electronic countermeasures, GNURadio Companion, Wireless communication vulnerabilities, Replay attacks, RC signal interference, GPS spoofing

6. (ID 266) The Integration of Drones into Military Operations

Authors: stud. Radu-Gabriel PREDA, stud. Luiza-Gabriela BOUROȘ

Scientific Advisors: Commander Octavian-Narcis VOLINTIRU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The integration of drones into military operations has revolutionized the way modern missions are carried out, offering significant advantages in terms of efficiency, precision, and safety. This study analyses the main types of drones used for military purposes – from reconnaissance to attack and transport – highlighting the tactical and strategic benefits they bring to armed forces. Additionally, it addresses the technological, ethical, and legal challenges associated with this emerging technology. Despite existing limitations, drones play a crucial role in modernizing and increasing the effectiveness of defense structures, marking an important milestone in the evolution of contemporary warfare.*

Keywords: drones, defense, technology

7. (ID 284) War at Sea: Legal Challenges in the Black Sea Region

Author: stud. Andrei Nicolae CIORBA

Institution: "Alexandru Ioan Cuza" Police Academy, București

Abstract: *The Black Sea has become a focal point of rising tensions, especially with Russia's military actions. While the United Nations Convention on the Law of the Sea (UNCLOS) provides essential guidelines for peaceful maritime conduct, it does not fully address conflict situations. My presentation explores the intersection of UNCLOS and the Law of Armed Conflict at Sea (LOAC), highlighting legal challenges in regulating weapons and military*

communication systems. Using recent case studies, including Russia's actions in the Black Sea, the discussion identifies gaps in current maritime law, especially in areas like cyber warfare and unmanned systems. By examining these legal grey zones, the presentation calls for a modernized, integrated legal framework that balances security, navigation rights, and humanitarian concerns to prevent escalation and ensure stability in the region.

Keywords: *maritime security, legal frameworks, conflict regulation*

8. (ID 285) The Young Guardian of the Romanian Skies: KP-SAM Chiron

Author: stud. Ștefan-Adrian MARINESCU

Scientific Advisors: Cpt. snr. instr. Bogdan ANDRIEȘ

Institution: Academia Forțelor Aeriene "Henri Coandă"

Abstract: *A detailed presentation about the newest VSHORAD system of the Romanian air defence.*

Keywords: *Chiron*

9. (ID 294) Unmanned Naval Vehicles: Typology and Tactics

Authors: stud. Alexandru TARLAPAN, stud. Igor ZAVALSKI

Institution: Military Academy "Alexandru cel Bun"

Abstract: *The authors investigate unmanned naval vehicles for military purposes, especially aspects of their use in recent conflicts. Based on the factual material, conclusions are made regarding the tactics of subunits equipped with naval unmanned vehicles. Proposals are also presented regarding the improvement of the Naval Forces in the drone boat field.*

Keywords: *Unmanned naval vehicles, drone boat use, drone boat tactics*

10. (ID 306) Communication - the key to finding the truth

Author: stud. Eduard-Gabriel BUGA

Scientific Advisors: Lecturer Irina BAKHAYA, PhD

Institution: "Al. I Cuza" Police Academy

Abstract: *Emerging with human beings, communication has been the main means by which they have been able to develop, breed and gain knowledge. Present everywhere and impossible to live without, communication proves time and time again that it is capable of*

producing various effects that can make our lives better or worse, depending on how it is used by each of us. Communication can indeed be appreciated as a treasure, and the person who knows how to value it at its true value is truly a lucky one, because he is able to enter easily into conversation with different people, has the ability to find out what interests him and can direct his thoughts as he wishes. This article looks at communication and how it contributes to the smooth running of public order and safety activities. From the simple interaction that these specialised personnel have with the ordinary citizen to finding out the truth, it is effective and well executed communication that shapes both the image they create externally and will carry throughout their careers and the success of certain cases through the gathering of information through a specialised form of communication, i.e. the judicial interrogation.

Keywords: *Communication, intereogation, police, truth*

11. (ID 328) The Capabilities and Potential of Unmanned Vehicles

Author: stud. Emilian DANCIU

Scientific Advisors: Assoc. Prof. Ovidiu CRISTEA, PhD; Prof. Ion CHIORCEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Unmanned surface and undersea vehicles (USVs and UUVs) are rapidly advancing technologies that with a significant impact on maritime operations. The increasing needs arising from the new threats may be alleviated, to a growing extent, by exploiting the benefits of unmanned systems. These systems are reshaping both commercial and military sectors by enhancing capabilities in surveillance, mine countermeasures, data collection, and autonomous navigation. This paper discusses the potential of USVs and UUVs in naval operations, examining their current state of development, operational requirements, technological challenges, and opportunities for improved performance. Recent studies indicate a clear trend towards increased autonomy, extended endurance, and greater adaptability for multi-mission roles. The paper concludes by outlining future research directions aimed at supporting broader adoption and increased operational effectiveness of these systems within engineering and navigation domains.*

Keywords: *UUV, USV, naval operations, autonomous navigation, future research*

12. (ID 342) Real Time Data Transfer and Processing Systems Based on Powerlink Technology

Author: stud. Serhii PAVLYSHYNETS

Scientific Advisors: Vladlen SHAPO

Institution: Naval Academy of Ukraine

Abstract: *Nowadays, dynamic development of military technologies brings us to the idea of applying modern solutions in the network technologies field. One of the main threats on the naval environment are supersonic and hypersonic weapons which creates some challenges on synchronization and processing of critical data with high accuracy within the extremely short time range, for what, many versions of the network technologies are not fully capable for. The logical solution is to involve modern real-time hardware and software systems to meet standards required. The Powerlink technology was designed and developed to extend the capabilities of standard Ethernet technology to provide real-time performance. It guarantees the transmission of critical data within very short timing of the cycle (200 microseconds with a deviation of 1 microsecond) and the synchronization of all network nodes in the sub-microsecond range. This approach will allow to solve a lot of existing and potential tasks.*

Keywords: *real-time, network technologies, Powerlink technology, data transfer*

13. (ID 364) Adapting to New Threats: The Role of UGVs in EOD Operations

Author: stud. Maria-Teodora CUREA

Scientific Advisors: Lieutenant jg. Silviu POPA, PhD student

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *In recent years, dangerous incidents like unauthorized drone flights and drifting naval mines have become more frequent near Romania's borders. These events reveal significant weaknesses in traditional security systems and show the urgent need for more innovative and more adaptable technologies. Naval mines, which are supposed to serve as defensive tools, can be moved from their*

original positions by natural forces, ending up in Romanian waters and posing serious risks to coastal populations and maritime traffic. At the same time, unmanned aerial vehicles (UAVs) that enter airspace without control or suffer technical problems can crash and damage property or hurt civilians. These types of threats are growing more unpredictable and harder to control. Because of this, it's essential to use advanced solutions that don't endanger human lives. One promising answer is using Unmanned Ground Vehicles (UGVs) in Explosive Ordnance Disposal (EOD) operations. These robots can detect, analyze, and neutralize unexploded ordnance (UXO) remotely, making them useful in hazardous environments. By using UGVs, military units can carry out dangerous missions more safely and efficiently, greatly reducing the exposure of personnel to life-threatening situations. As threat patterns continue to evolve, the adoption of intelligent unmanned systems like EOD-capable UGVs is becoming essential for both national security and public safety.

Keywords: *Unmanned systems, unexploded ordnance, UGVs, risk prevention, EOD.*

14. (ID 366) The Whitehead Torpedo

Author: stud. Mark TIMOTITY

Institution: "Al. I Cuza" Police Academy

Abstract: *The Whitehead torpedo was the first self-propelled or "locomotive" torpedo ever developed and it was probably the most influential invention after the airplane, leading to the invention of the destroyer. It was perfected in 1866 by British engineer Robert Whitehead from a rough design conceived by Giovanni Luppis of the Austro-Hungarian Navy in Fiume. Driven by a three-cylinder compressed-air engine invented, designed, and made by Peter Brotherhood, the torpedo was used to sink more ships in World War II than either bombs or guns. It continues as the weapon of choice for submarines and as the best weapon for defeating submarines. Many naval services procured the Whitehead torpedo during the 1870s, including the US Navy. This early but formidable weapon proved itself in combat during the Russo-Turkish War when, on 16 January 1878, the Ottoman ship Intibah was sunk by Russian torpedo boats carrying Whiteheads.*

Keywords: *Torpedo, weapon, navy*

15. (ID 407) Modular Architecture of Multi-Role Autonomous Systems in the Context of Hybrid Conflicts

Author: stud. Gabriel LEIZERIUC

Scientific Advisors: Captain Assoc. Prof. Eng. Paul BURLACU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The accelerated technological evolution of recent decades has favored the development and integration of autonomous platforms within naval forces, and marine surface drones (Unnamed Surface Vehicles - USVs) are emerging as one of the most promising solutions for the future of maritime defense. These autonomous systems have the ability to perform a wide range of missions - including reconnaissance, surveillance, electronic warfare, anti-submarine warfare, mine clearing, or logistical transport - with minimal risk to human lives and at significantly reduced operational cost compared to traditional military ships. A defining element in the efficiency and versatility of USVs is the architectural modularity of mission equipment and systems. The implementation of a modular design allows quick and easy integration of various payloads (payloads), sensors, weapons systems or software packages, without the need for major structural changes. This concept transforms USVs into a multi-role platform, able to promptly respond to the varied demands of the contemporary operational environment, characterized by asymmetry, uncertainty and increased dynamics. From a strategic and economic perspective, the use of modular USVs offers clear advantages: significant reduction of acquisition, operation and maintenance costs, logistical flexibility, scalability, as well as better allocation of human and material resources. In addition, the autonomy of these platforms contributes to increasing persistence in theaters of operations, allowing for long-term missions and in difficult conditions without exposing staff to direct risks. In the current context of hybrid conflicts and the need for an extended maritime presence, modular surface drones are no longer just a technological option, but become a critical component in the architecture of the naval forces of the future. The ability to conduct complex operations autonomously, adaptability to multiple mission scenarios and interoperability with other systems (air, underwater,*

satellite or terrestrial) reinforce the role of USVs as a force multiplier and key factor in redefining maritime superiority.

Keywords: *autonomous systems, architectural modularity, multi-role platform, hybrid conflicts*

16. (ID 418) Maritime Tactical Data Links: Enhancing Accuracy and Speed of Weapon Systems through Real-time Communication

Author: stud. Diana -Carmen PETREȚCHI

Scientific Advisors: Prof. Bogdan ȚONEA, PhD

Institution: "Al. I Cuza" Police Academy

Abstract: *Tactical Data Systems (TDS) are used on naval platforms to integrate sensors like radar, AIS, and Tactical Data Link Processors (TDLP) for navigation and surveillance. As part of C4ISR, Tactical Data Links (TDL) enable real-time, secure data exchange across air, surface, and subsurface units. Their purpose is to enhance situational awareness, interoperability, and decision-making in modern maritime operations through seamless and continuous information sharing.*

Keywords: *Data, information, sensors*

17. (ID 426) Communication Between Fighter Jets and Warships in Joint Operations

Authors: stud. Ștefan Tudor MOCANU, stud. Ștefan Cosmin MĂȚĂ

Scientific Advisors: Assoc. prof. Ionică CÎRCIU, PhD

Institution: „Henri Coanda” Air Force Academy

Abstract: *This paper examines the technical aspects of communication between fighter aircraft and warships involved in joint military operations. We chose this topic because it reflects both our academic background and our professional interest in the coordination between air and naval forces. Since we did not have access to classified communication protocols, we based our research on publicly available NATO documentation, case studies, and technical reports. The study focuses on NATO-standardized systems such as Link 16, SATCOM, and commonly used radio frequencies (VHF/UHF), and analyzes how they contribute to real-time coordination, interoperability, and mission success. We also looked*

into the main challenges that affect communication efficiency, including electromagnetic interference, limited compatibility between platforms, and the complexity of managing multi-domain operations. In addition, we looked at new technologies being introduced in military communication, such as using artificial intelligence to help manage and prioritize data transmission. We also examined how network-based systems are becoming increasingly important in coordinating joint operations. These developments show that having flexible, well-integrated communication systems can make a real difference in how fast and effectively missions are carried out.

Keywords: Joint military operations, air–naval communication, NATO-standardized systems, Link 16, SATCOM, interoperability, communication efficiency.

18. (ID 450) Using Kali Linux for Education in the Cyber Security Field

Author: stud. Dmytro ULIZKO

Scientific Advisor: Vladlen SHAPO

Institution: Naval Academy of Ukraine

Abstract: *Questions of cyber hygiene and cyber security became highly important last years. Different technical systems are equipped with personal, industrial, one board computers, programmable controllers etc. A lot of such systems are connected to the Internet for remote management realization. Simultaneously the number of different hacker attacks grows permanently, and it's necessary to protect any information system. Kali Linux application for the specialists training is a step ahead to this goal. There are different software tools which allow to enhance the qualification in the field of cyber hygiene and cyber security. Kali Linux is one of them. It allows to obtain additional knowledge and practical skills in cybersecurity, general informatics, cyber hygiene. Kali supports penetration testing, encryption analysis, network diagnostics and has over 600 tools integrated by default. Integrating Kali into the “Informatics and cyber hygiene” and “Cyber security basics” academic subjects will help to prepare more qualified professionals.*

Keywords: cyber hygiene, cyber security, Kali Linux, qualification enhancement

19. (ID 462) Eyes in the Sky, Power on the Ground: Military Drones Reshaping Modern Conflict

Authors: stud. Andra-Ioana MATEI, stud. Maria-Antonia TESLIUC

Scientific Advisors: Police Chief Assoc. prof. Nicolae-David UNGUREANU, PhD

Institution: "Al. I Cuza" Police Academy

Abstract: *"Eyes in the Sky, Power on the Ground: Military Drones Reshaping Modern Conflict" examines the controversial rise of unmanned aerial vehicles (UAVs) in contemporary warfare. Although drones have revolutionized military strategy as seen in the conflicts in Afghanistan, the Russia-Ukraine war, and U.S. operations targeting terrorist groups their deployment raises serious legal and ethical concerns. Notably, military drones are not explicitly addressed in major international legal instruments such as the 1944 Chicago Convention on International Civil Aviation, which governs civil aviation but excludes state aircraft. Similarly, national regulations, including Romania's legislative framework, remain focused on civil drone use, offering little guidance on military applications. The International Civil Aviation Organization (ICAO) has yet to issue binding norms for the use of military UAVs in conflict zones, leaving a legal vacuum. This paper explores the urgent need for international consensus on the regulation of armed drones in warfare, where legality remains as unclear as the skies they dominate.*

Keywords: *Military drones; International law; Chicago Convention; Unmanned aerial vehicles (UAVs); Modern warfare; International Civil Aviation Organization (ICAO)*

20. (ID 475) Symbolology and Propaganda: The Silent weapons of Modern Communication

Author: stud. Cezar-Vasile PITI

Scientific Advisors: Police Chief Assoc. prof. Nicolae-David UNGUREANU, PhD

Institution: "Al. I Cuza" Police Academy

Abstract: *In the contemporary world of conflict and communication, propaganda and symbolic messaging emerge as effective tools used to confuse and stir up the population. The goal of this study is to examine the historical evolution of symbols and how their meanings*

have been altered by extremist groups to serve their needs. Historical examples such as the Celtic cross and the swastika will be analyzed alongside their contemporary uses in digital and political spaces. It will also analyze the messages and speeches of political actors in order to uncover the meaning behind rhetorical embellishment and to assess how susceptible the public is to such influence. Ultimately, the project aims to demonstrate that in the age of information, control over symbolic narratives can be just as decisive as control over physical territory.

Keywords: Symbolism, Propaganda, Radicalism, Division

21. (ID 478) The Threat of Naval Mines in the Black Sea – Challenges to Romania's Maritime Security

Author: stud. Mihăiță IONESCU

Institution: "Al. I Cuza" Police Academy

Abstract: *The Threat of Naval Mines in the Black Sea – Challenges to Romania's Maritime Security*

In the geo-political context of the active military conflict between the Russian Federation and Ukraine, which began in 2022, the Black Sea has once again become a strategically significant strategical space, but also an area of serious risk. Some of the aspects that have become a problem in this space is the proliferation of naval mines an old weapon that has gained valuable progress. Naval mines, either deliberately deployed or lost during either defending or attacking of Ukrainian coastlines, have been carried by currents and have even reached Romanian territorial waters. These incidents have had a serious impact on the safety of navigation, leading to immediate interventions by the Romanian Naval Forces and other security structures. Since the beginning of 2022, several cases have been reported of naval mines discovered near the Romanian coastline, affecting commercial routes and generating a constant state of alert in the maritime sector. This study aims to analyze this threat from a multidisciplinary perspective, focusing on:the origin, types, and probable trajectory of naval mines identified within Romania's Exclusive Economic Zone (EEZ);the technical and operational methods for detecting, monitoring, and neutralizing these devices, used by the Romanian Naval Forces and their NATO partners;the impact on commercial routes, tourism, fishing, and critical maritime

infrastructure, such as ports and offshore platforms; the need of new equipment for preventing and establishing security, the development of anti-mine capabilities, and regional cooperation. The conclusions show that naval mines are not a very dangerous threat, but, still, they have a strong and destructive power and they can seriously affect freedom of navigation and maritime safety. In this way, Romania needs to boost its capabilities to firmly respond to these possible threats to its national security. This topic proves to be highly relevant not only for the training of future naval officers but also for understanding the current dynamics of regional security, where hybrid warfare extends into the maritime space.

Keywords: Mines, Black Sea Defence

22. (ID 481) Communication as a Weapon: From World Wars to Modern Conflicts – The Evolution of Tools and Social Impact

Author: stud. Daniel-Andrei LUCHINCIUC

Scientific Advisors: Police subcommissar, Assoc. prof., Mimi-Carmina COJOCARU, PhD

Institution: "Al. I Cuza" Police Academy

Abstract: *Communication has become a primary weapon in modern warfare, influencing both military strategy and public perception. This paper explores the evolution of communication from World War I, where propaganda mobilized civilians, to World War II, where radio and cinema were pivotal in shaping narratives. During the Cold War, media furthered ideological battles, and in contemporary conflicts, digital platforms and social media have become integral tools of warfare. For example, during the Russian invasion of Ukraine, disinformation spread through platforms like Twitter and Telegram significantly impacted public opinion. Similarly, deepfake technology has been used in the Syrian conflict to manipulate visual narratives. The rise of cyber warfare and online content manipulation, such as the interference in the 2016 U.S. election, highlights the growing role of digital communication in modern conflicts. This paper examines how communication strategies have transformed the battlefield, influencing societal divisions, public mobilization, and morale in both military and civilian spheres.*

Keywords: Communication as a weapon, Military propaganda, Digital warfare, Cyber warfare, Disinformation campaigns

23. (ID 121) Cybersecurity-Cryptography and Steganography

Authors: stud. Andreea-Ysabela TRUTESCU, stud. AnaMaria-Raluca RISTACHE

Scientific Advisors: Lecturer Postolache Florin, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Cybersecurity refers to the entirety of strategies, technologies, and practices adopted to protect information systems, networks, and data from cyber threats. The main goal is to ensure the confidentiality, integrity, and availability of information, thus preventing unauthorized access, unintentional modifications, or data destruction. Cryptography is the art and science of securing communications and information through mathematical and algorithmic methods. The primary purpose of cryptography is to protect the authenticity of data from unwanted changes. Steganography is the art of hiding information within seemingly harmless content to keep it secret. Its main goal is similar to that of cryptography but differs in hiding the existence of secret information. Today, technology has taken over all aspects of people's private lives, from socializing, financial accounts, to personal data. Thus, we can say that our entire lives are stored online and are also at risk of being accessed by anyone with access to them. The need to be more developed and secure to protect ourselves brings great responsibility and a challenge for everyone in the online environment, both for users who expect protection and for those employed in this field.*

Keywords: *cryptography, steganography, confidentiality, integrity, availability of information*

VI. SECTION: MECHANICAL ENGINEERING

Section Committee:

Chairman: CDR Lecturer Narcis VOLINTIRU, PhD

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Stud. Bogdan SANDU

Stud. Ştefan POPA

Stud. Rareş-Andrei VASILE

Stud. Marcel STRATULAT

Room: E122

1. (ID 7) The Contribution of Mechanical Engineering to The Development of Sustainable Solutions in Transport and Material Handling

Authors: stud. Stefania-Sorina MOCANU, stud. Andrei-Cornel OLTEANU, stud. Valentina VOICU

Scientific Advisor: Lieutenant Colonel Assoc. Prof. Daniela-Elena HRAB

Institution: National Defence University "Carol I" Bucureşti

Abstract: *The integration of mechanical engineering into logistics has become increasingly vital in addressing the growing demands for sustainability, efficiency, and innovation in modern transport and material handling systems. As global supply chains evolve to meet stricter environmental regulations and consumer expectations, the role of mechanical engineering in optimizing logistics processes cannot be overstated. This paper explores how advancements in mechanical engineering contribute to sustainable solutions by focusing on three critical dimensions: reducing energy consumption, minimizing environmental impact, and enhancing the overall performance and reliability of logistics systems. Key areas of investigation include the optimization of vehicle design through lightweight materials and improved aerodynamics, the development of energy-efficient engines and powertrains, and the implementation of durable and eco-friendly materials in logistics infrastructure. Additionally, the paper examines the transformative potential of*

automated mechanical systems in material handling, emphasizing innovations such as robotics, conveyor systems, and autonomous vehicles that enhance operational efficiency while reducing waste and resource consumption. Through detailed case studies of state-of-the-art logistics systems, this study highlights the measurable benefits of mechanical engineering innovations. Examples include significant reductions in carbon emissions, lower operational costs due to energy savings, and increased system longevity through the adoption of advanced technologies. The analysis also discusses challenges associated with the adoption of such innovations, including cost barriers and the need for interdisciplinary collaboration between engineers, environmental scientists, and logistics professionals. The findings of this research underline the critical role of mechanical engineering as a driving force in the sustainable evolution of logistics. By fostering the integration of advanced technologies and engineering principles, the industry can achieve greener, more efficient, and cost-effective supply chains. Ultimately, the study advocates for continued investment in mechanical engineering research and development as a means of addressing future challenges in global logistics and ensuring long-term sustainability.

Keywords: *Mechanical engineering, logistics, sustainability, energy efficiency, environmental impact, material handling systems, vehicle optimization, lightweight materials, aerodynamics, eco-friendly technologies, automated systems, robotics in logistics, supply chain innovation, carbon emissions reduction, durable technologies.*

2. (ID 16) Predictive Maintenance Techniques to Reduce Fuel Consumption and Increase Efficiency in Military Operations

Authors: stud. Cristian-Valentin MURGOI, stud. Cornelia-Maria SĂRARU

Scientific Advisor: Lieutenant Colonel Assoc. Prof. Daniela-Elena HRAB

Institution: National Defence University "Carol I" București

Abstract: *Predictive maintenance has become an essential strategy in modern military operations, leveraging advanced technologies to enhance efficiency and sustainability. This article aims to explore the potential application of predictive maintenance techniques to optimize logistic support in military operations. To achieve this*

objective, the method of analyzing relevant documents in the field of predictive maintenance was employed. The results show that by integrating artificial intelligence (AI) and data analysis, it becomes possible to detect faults early, perform accurate diagnostics, and make real-time decisions for military vehicles and equipment. Moreover, the findings demonstrate the potential for significant improvements in fuel efficiency, cost reduction, and operational readiness, contributing to the sustainability and effectiveness of military missions.

Keywords: *predictive maintenance; fuel consumption efficiency; artificial intelligence; data analysis; operational optimization; sustainability.*

3. (ID 23) Propulsion System Analysis for a Platform Supply Vessel (PSV)

Author: stud. Cosmin - Alexandru STANCU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Platform supply vessels (PSVs) are specialized ships designed to support offshore platforms and drilling rigs. Their primary function is to transport cargo, supplies, and personnel between ports and offshore installations, which are typically located several kilometers from the coast. To fulfill this role, PSVs feature expansive open deck areas for equipment storage, while their hulls are equipped with tanks for carrying liquid or dry bulk cargo. These vessels are generally fitted with dynamic positioning systems, essential for maintaining position near offshore structures*

Keywords: *Platform Supply Vessel (PSV), Propulsion system, Dynamic positioning, Electric propulsion, Prime movers, Diesel engines, Synchronous generators*

4. (ID 24) AZIPOD Naval Propulsion System Considerations

Author: stud. Cosmin - Alexandru STANCU

Scientific Advisor: Prof. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *For over three decades the AZIPOD propulsion concept has provided the shipping industry with unique benefits in ship design, construction and operations. AZIPOD, which stands for*

Azimuthing Podded Drive, represents a revolutionary approach to propulsion. Originally introduced in the late 1980's, AZIPOD created a revolution in ship propulsion technology and quickly established a new propulsion standard for icegoing vessels and has become the market leader in the cruise ship segment. Azimuthal thrusters in ship propulsion have existed for many years in various forms. An azimuthal thruster is a configuration of ship in which the prime mover which is inside the ship is connected to the propellers placed in pods, through one or two right angle gears designated as L or Z drives respectively. Their main feature is the combination of the propulsive function with that of steering, eliminating the need for a rudder. This ensures the ship's steering and maneuverability through the slewing motion of the propeller, rotation in the horizontal plane.

Keywords: AZIPOD propulsion Azimuthing Podded Drive Ship Propulsion Azimuth Thrusters Electric Propulsion Maneuverability

5. (ID 77) Hydrogen Dual-Fuel Ships: Innovation and the Future of Maritime Transport

Authors: stud. Gabriel-Alexandru HONȚ, stud. Ionuț-Lucian IVANA

Scientific Advisor: Lecturer Eng. Ionel POPA, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This paper explores the use of hydrogen as an alternative fuel in maritime transport, focusing on dual-fuel vessel technology. As global regulations push for reduced greenhouse gas emissions, hydrogen emerges as a viable solution due to its high energy potential and zero CO₂ emissions when used. The study analyzes the economic, social, and technological implications of integrating hydrogen into the shipping industry. It presents current technologies such as internal combustion dual-fuel engines and hydrogen fuel cells, alongside storage solutions for marine applications. Real-world case studies, including HySHIP and MF Hydra, demonstrate the feasibility and environmental benefits of hydrogen-powered vessels. Although challenges like infrastructure costs and fuel availability remain, the long-term advantages suggest a promising future for hydrogen in decarbonizing maritime transport.*

Keywords: Hydrogen Dual-Fuel Ships, ship pollution, alternative energy sources

6. (ID 190) 3D Modeling and CNC Machining Path Generation for A Mechanical Part. Case Study.

Authors: stud. Madalin-George ANA, stud. Mircea-Georgian APOSTOL, stud. Malin-Iulian CRISU

Scientific Advisor: Eng. Doru COSOFREȚ, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The development of computerized technologies has also been implemented in the field of mechanical machining in order to increase productivity. In the present article we approach the design of a mechanical part (protective disk) by developing a 3D model and a G-code program, which can be implemented on any CNC machine. The simulation of the realized program was done using a specialized software. The use of CNC technology has an important contribution on the productivity of mass-produced parts, increase in their machining accuracy and reduction of human errors by decreasing the physical intervention on the machining process by the operator.*

Keywords: CNC, industrial, safeguard

7. (ID 212) Virtual Simulation of the Mircea School Ship Through 3D Modeling

Author: stud. Robert Andrei PĂSĂRICĂ

Scientific Advisors: SR3 eng. Alexandru PINTILIE, PhD, Lecturer eng. Elena ROBE, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This paper aims to create a detailed 3D model of the training ship Mircea, using AutoCAD 3D software. It focuses on the accuracy of scale design, respecting the proportions and construction details of the real ship from the hull structure to the deck elements and naval architectural features. The modeling process involves technical documentation, interpretation of original plans, and their translation into a three-dimensional digital environment. The final model will serve as a basis for potential integration into a virtual reality system, allowing interactive exploration of the designed space. The paper combines the technical rigor of engineering with the capabilities offered by modern visualization technologies.*

Keywords: 3D modeling, digitalization, virtualization, scale design

8. (ID 242) Quantitative Reliability Analysis of Naval Systems.

Case Study: 2200 TEU Container Ship

Author: stud. Iuliana AMBROSE

Scientific Advisor: Eng. Doru COSOFREȚ, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Quantitative reliability analysis is an essential tool in the evaluation of the technical performance of systems, with the objective of determining the probability of failure-free operation within a specific time interval. This approach is based on historical failure data and allows the identification of components with a high failure risk. By applying quantitative reliability analysis, informed decisions can be made to optimize maintenance plans, reduce downtime and increase operational safety. In this paper, the analysis was applied to the fuel system of a 2200 TEU container ship, a critical system operating with both HFO (Heavy Fuel Oil) and MDO (Marine Diesel Oil). Based on the failure history, a Pareto diagram was constructed highlighting the components with the highest failure frequency. This diagram serves as a decision-making tool in the development of preventive maintenance measures, helping to maintain the installation in optimal operating parameters and preventing unplanned shutdowns that may affect the operation of the ship.*

Keywords: *reliability, optimization, maintenance, failure, installation*

9. (ID 254) Energy Efficiency Analysis of Ships with Unconventional Propulsion. Case Study.

Author: stud. Andrei MONEA

Scientific Advisor: Eng. Doru COSOFREȚ, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The increasingly restrictive requirements for reducing global CO₂ emissions have led the shipping industry to adopt unconventional propulsion solutions. One such solution is electric propulsion, which is powered by electricity that is generated from engines fueled by a hybrid dual-fuel system (LNG and MDO). This research presents an analysis of the energy efficiency of an electrically powered cruise ship (AIDAnova). The study results highlight the superior energy efficiency of the ship when the engines are powered by LNG, compared to when they are powered by MDO.*

Keywords: CO₂ emissions, electric propulsion, dual-fuel systems, pollution, LNG

10. (ID 271) Design, simulation, and CNC machining of a mechanical part: A case study

Authors: stud. Robert BOCA, stud Lucian-Cosmic CHIȚU, stud. Ionuț GHEORGHE

Scientific Advisor: Eng. Doru COSOFREȚ, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The implementation of computerized technologies in the field of mechanical machining has led to a significant increase in productivity and quality of technological processes. This paper presents the stages of designing a mechanical part, starting from the realization of a three-dimensional CAD model to the generation of a G-code machining program, compatible with various types of CNC machine tools. The simulation of the technological process was carried out using specialized software, allowing the validation of the tool path and the optimization of machining parameters. The use of CNC equipment contributes to increased efficiency in mass production, improved dimensional-geometric accuracy of the parts, as well as a significant reduction in human error by minimizing operator intervention in the manufacturing process.*

Keywords: Design, Simulation, CNC

11. (ID 280) Study on Energy Efficiency of Hybrid Propulsion Ships: Case Study of a Container Ship

Author: stud. Ionut Daniel ABAGIU

Scientific Advisor: Eng. Doru COSOFREȚ, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *In a period when international regulations regarding pollutant emissions are becoming increasingly restrictive, and the pressure to decarbonize maritime transport is reaching unprecedented levels, the shipping industry faces a fundamental choice: adapt or stagnate. Within this context, identifying alternative propulsion solutions becomes not merely a viable option, but an essential requirement for the long-term survival and competitiveness of economic operators in the maritime sector. This paper aims to practically analyze the opportunity of adopting hybrid propulsion on*

a container ship through the installation of four Flettner rotors a technology based on the Magnus effect, which allows harnessing wind power as an additional propulsion source. Flettner rotors consist of large, vertically rotating cylinders that convert wind energy into propulsion, significantly reducing dependence on fossil fuels. Far from being merely a spectacular innovation, this solution proves pragmatic, capable of substantially lowering fuel consumption, emissions of greenhouse gases (GHG), and critical pollutants such as nitrogen oxides (NOx) and sulfur oxides (SOx), which are increasingly regulated by the International Maritime Organization (IMO). The study provides detailed calculations of fuel consumption, emissions reductions (with particular emphasis on NOx and SOx), and the economic implications of implementing the Flettner rotor system onboard a container ship. By integrating wind propulsion, significant reductions in exhaust emissions are achievable, helping ship operators meet stringent IMO regulations, particularly MARPOL Annex VI, which stipulates strict limits for NOx and SOx emissions. Starting from operational scenarios in conventional and hybrid modes, the paper compares energy performance and evaluates associated costs and benefits both from the shipowner's perspective and in relation to compliance with IMO environmental standards. Through a rigorous analytical approach complemented by a sustainability-oriented vision, this research contributes to a deeper understanding of how alternative technologies like the Flettner rotor system can facilitate regulatory compliance and sustainable maritime operations in the modern commercial fleet.

Keywords: Hybrid Propulsion Ships

12. (ID 324) Immersive Technologies in Maritime Training Implementing VR/AR in Naval Education

Authors: stud. Andrei-Daniele ILIE, stud. Eduard-Benone TARÎNT

Scientific Advisor: SR3 eng. Alexandru PINTILIE, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This project examines the incorporation of Virtual Reality (VR) and Augmented Reality (AR) technologies in naval officer training, emphasizing their potential to improve learning efficiency, engagement, and situational awareness. This paper discusses current*

VR/AR solutions, their application methods in the context of maritime education, and pedagogical value of these technologies on simulated training atmosphere. A simple example is implemented using Kat Walk Mini S VR equipment to demonstrate an interactive virtual ship tour. In this scenario, users can transfer their learned skills to an operational context of the military vessel (ex: bridge, engine room) by experiencing a fully immersive environment within the context of real-world naval situations without the constraints of the logistical and safety issues. Additionally, this paper highlights some of the major trends that will mark the future of military education such as AI driven adaptive training, XR convergence and gamification. Studies have shown that VR/AR technologies are not just complementary tools but essential components in developing a modern, experience-based learning framework for future naval officers.

Keywords: VR/AR/XR Platform, Immersive

13. (ID 363) Methodology for Hydrodynamic Analysis of a Single Hull using Ansys Fluent

Author: stud. Cătălin Cristian BOCANACIUC

Scientific Advisor: Eng. Doru COSOFREȚ, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This methodology details the CFD analysis of a ship hull using Ansys Fluent to characterize hydrodynamic performance, focusing on flow and resistance prediction via four phases:*

Preprocessing: Model the hull geometry using Rhino3D and create a sufficiently large computational fluid domain. Discretize the domain with a quality mesh, refined near the hull, bow/stern, and potential free surface, ensuring numerical stability.

Simulation Setup (Fluent): Select appropriate RANS turbulence (e.g., $k-\epsilon/k-\omega$ SST) and VOF (if free surface) models. Define boundary conditions (inlet velocity, outlet pressure, hull no-slip wall, free surface), specify fluid properties (water density/viscosity), initialize the flow field, and set convergence criteria (e.g., residuals $< 10^{-6}$, stable forces).

Simulation Execution: Run the iterative solver, monitoring residuals and key indicators until convergence (steady-state or periodic stability) is achieved.

Post-processing: Analyze converged data through qualitative visualization (pressure/velocity fields, streamlines) to understand flow topology (separation, vortices) and quantitative assessment, primarily extracting integrated hydrodynamic forces, especially the total drag force (resistance).

This CFD approach enables evaluation of the hull's hydrodynamic efficiency and flow

Keywords: Computational Fluid Dynamics (CFD), Ship Hull Hydrodynamics, Ansys Fluent, Rhino3D, Resistance Prediction, Meshing, Turbulence Modeling, Boundary Conditions, Free Surface Flow (VOF), Post-processing, Drag Force, Flow Visualization

14. (ID 372) Modern Naval Propulsion Concepts

Authors: stud. Mihail-Andrei GHEORGHIU, stud. Andrei-Alex MAN

Scientific Advisor: SR3 eng. Alexandru PINTILIE, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The evolution of marine propulsion systems reflects the continuous transition of the maritime industry towards increasingly efficient, sustainable solutions adapted to modern operational requirements. This article analyzes the most important modern marine propulsion concepts, with a focus on dual fuel diesel-electric (DFDE) systems. Innovations such as Ultra Steam Turbine and Hydrogen Fuel Cells are also presented. The study provides a comparison between the different systems from the perspective of efficiency, operational costs, oil consumption and energy efficiency, highlighting the advantages of diesel-electric propulsion in the context of current decarbonization requirements.*

15. (ID 376) General Aspects of 12000 DWT Cargo Ships

Author: stud. Ouz-Gean BILECEN

Scientific Advisor: Lecturer eng. Aurelia CHIOIBAȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This paper presents a general overview of 12,000 Deadweight Tonnage (DWT) cargo ships, focusing on their structural, operational, and technical characteristics. These medium-sized vessels play a crucial role in global maritime logistics, particularly in the transport of bulk goods and general cargo. The*

study outlines key design parameters, such as dimensions, propulsion systems, cargo handling equipment, and onboard systems.

Keywords: *Cargo ships, parameters, propulsion systems*

16. (ID 377) Long-Stroke Diesel Engine

Author: stud. Ouz-Gean BILECEN

Scientific Advisor: Lecturer eng. Aurelia CHIOIBAȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Long-stroke diesel engines represent a key advancement in internal combustion engine design, offering improved thermal efficiency and fuel economy. Characterized by a longer piston stroke relative to the cylinder bore, these engines generate higher torque at lower RPMs, making them ideal for applications requiring sustained power output, such as in maritime propulsion and heavy-duty machinery.*

Keywords: *fuel economy, diesel engine, maritime propulsion*

17. (ID 381) Efficiency of Gas Turbines on Military Ships

Author: stud. Eduard Ionuț CHIREA

Scientific Advisor: LCDR lecturer eng. Narcis VOLINTIRU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *Efficiency of Gas Turbines in Military Naval Vessels*

Gas turbines play a crucial role in the modern propulsion systems of military naval vessels due to their high power-to-weight ratio and rapid response time. This project analyzes the operating principle of gas turbines, based on the Brayton thermodynamic cycle, in which air is compressed, mixed with fuel, combusted in a combustion chamber, and the resulting hot gases drive a turbine to produce mechanical energy. The main components the compressor, combustion chamber, and turbine are presented along with their roles in ensuring efficient operation. The paper explores the advantages of using gas turbines in military ships, such as low weight, compact size, fast startup, and increased reliability, compared to diesel or steam propulsion systems. It also examines the disadvantages, including high fuel consumption, lower efficiency at partial loads, and complex maintenance requirements. The study offers insight into the potential of these systems in the context of

modern naval needs, such as enhanced mobility, mission flexibility, and integration into advanced combat platforms.

Keywords: Gas Turbines, Military Naval Vassels

18. (ID 408) The Role of The Bilge System in Ship Safety: Mechanical Challenges and Modern Technological Solutions

Authors: stud. Vasile-Georgel GAVRILOV, stud. Leonard-Nicolae CHIȚU, stud. Adrian Aurel GRIGORAȘ

Scientific Advisor: Lecturer eng. Aurelia CHIOIBAȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The bilge system is essential for ship safety, preventing water and fluid accumulation in critical compartments. This paper examines the main mechanical challenges associated with bilge installations, including pump reliability, corrosion, and clogging. It also highlights modern solutions such as automation, smart sensors, and compliance with IMO regulations. The study aims to improve the system's efficiency and reliability through practical and innovative approaches.*

Keywords: Bilge system, Ship safety, Bilge pump, Marine engineering

19. (ID 420) Study of Synchronous and Asynchronous Magnetic Couplings in the Naval Transmission Line

Author: stud. Antonio-Gabriel SCURTU

Scientific Advisor: Lecturer eng. Vlad MOCANU, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This study investigates the implementation and performance of synchronous and asynchronous magnetic couplings in naval propulsion systems, with a focus on minehunter vessels. The aim is to enhance transmission efficiency, reduce maintenance, and improve operational safety by replacing traditional mechanical transmission systems with advanced magnetic couplings. Three types of magnetic couplings are analyzed: axial synchronous, radial synchronous and asynchronous couplings based on eddy currents. Each type is evaluated in terms of torque transmission capacity, energy efficiency, vibration damping, maintenance requirements, and spatial integration.*

Keywords: magnetic coupling, clutch, gearbox, naval propulsion;

20. (ID 433) The Gas Turbine: Between Energy Performance and Ecological Responsibility

Authors: stud. Petre-Eduard LUNGU, stud. Marian PARASCHIV

Scientific Advisor: Lecturer, eng. Ionel POPA, PhD.

Institution: "Mircea cel Bătrân" Naval Academy

Abstract: *This paper addresses the role of gas turbines in the context of the transition towards a greener and more sustainable economy, analyzing both recent European regulations on renewable and low-carbon fuels and current technologies aimed at optimizing their efficiency and controlling emissions. In light of the European Union's ambitious objectives targeting climate neutrality by 2050 and significant reductions in greenhouse gas emissions within the maritime transport sector and the energy industry, gas turbines represent a critical point in this transition. The paper details essential technical and environmental parameters related to turbine operation, including the influence of fuel-air ratio, combustion temperature, and optimization of exhaust gas parameters. Additionally, it highlights specific challenges in measuring and controlling emissions, proposing solutions to enhance performance and ensure compliance with legal requirements regarding emissions and energy efficiency.*

Keywords: Gas Turbines, Gas Emissions, Maritime Transport

21. (ID 439) Green Engineering: Managing Projects with Sustainability

Authors: stud. Alexandru GĂITAN, stud. Maria-Karina LUCA

Institution: "Alexandru Ioan Cuza" Police Academy București

Abstract: *Green engineering represents a transformative approach to project management, integrating sustainability principles into every phase of design, construction, and operation. This paradigm shift aligns with the objectives of the European Green Deal, which aims to make the EU climate-neutral by 2050 while fostering circular economies and reducing environmental degradation.*

Keywords: green engineering, sustainable project management, European Green Deal, circular economy, green hydrogen, decarbonization.

22. (ID 440) An Overview of Computational Fluid Dynamics

Author: stud. Elena STANCIU

Scientific Advisor: Lecturer, eng. George NOVAC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *We live in a world of motion, in which the fluids have a pervasive presence. This paper studies CFD (Computational Fluid Dynamics). Although it requires a good theoretical base, CFD is one of the primary tools, besides experimental methods, that are used to analyze, predict and understand the movements of fluids that interact with other systems.*

Keywords: *CFD, simulation, fluid flow*

23. (ID 472) Hydrogen as an Alternative Energy Source in Road Transport

Author: stud. Marius Gabriel MIERTOIU

Scientific Advisor: Prof. eng. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *we will analyze hydrogen as an alternative energy source for road transportation. Hydrogen, when used in fuel cells, produces electricity through a chemical reaction with oxygen, emitting only water vapor as a byproduct. This makes it an environmentally friendly option compared to traditional fossil fuels. One of its key advantages is the quick refueling time and extended driving range, similar to conventional vehicles. However, challenges such as high production costs and limited refueling infrastructure still hinder widespread adoption. Despite these obstacles, continuous advancements in technology and increasing investments suggest a promising future for hydrogen-powered transportation.*

24. (ID 497) Types of Government Meetings

Author: stud. Octavian BURTEA

Scientific Advisor: Prof. eng. Gheorghe SAMOILESCU, PhD

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *This project explores the various types of maritime steering systems used to control the direction and maneuverability of ships. Steering systems are essential components of a vessel's navigation infrastructure, ensuring stability, safety, and precise control in diverse maritime conditions. The study categorizes and analyzes the*

main types of steering systems, including mechanical, hydraulic, electro-hydraulic, and electric systems. Each type is examined in terms of its components, working principles, advantages, and limitations. Special attention is given to modern technologies such as electro-hydraulic systems and their integration with automatic control systems and autopilots. The project also highlights the evolution of steering mechanisms from traditional designs to advanced, computer-controlled systems used in modern vessels. Through technical analysis and comparative evaluation, this work provides a comprehensive understanding of how maritime steering systems contribute to the overall performance and safety of ships.

Keywords: *hydraulic, systems*

25. (ID 499) Wankel Engine

Author: stud. Bogdan George SANDU

Institution: “Mircea cel Bătrân” Naval Academy

Abstract: *The Wankel engine, also known as a rotary engine, is an internal combustion engine that uses a rotating triangular rotor instead of reciprocating pistons. Its unique design allows for fewer moving parts, smoother operation, and a compact, lightweight build. The rotor turns within an oval-like housing, creating three separate combustion chambers that follow the four-stroke cycle. Despite its advantages in performance and size, challenges such as apex seal wear and fuel efficiency have limited its widespread use. The engine remains notable for its application in certain sports cars and aviation.*

Keywords: *Rotary engine 2. Eccentric shaft 3. Combustion chamber 4. Apex seal 5. Compact design*

26. (ID 491) Leveraging Python for Parametric Design and Automation in AutoCAD

Author: stud. Alexandra-Ioana ISOPESCU

Scientific Advisors: SR3 eng. Alexandru PINTILIE, PhD, Lecturer eng. Elena ROBE-VOINEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In technical drawing, representing repetitive elements can lead to human errors and extend the rendering interval, making it significantly more difficult to obtain the final product. To streamline*

and automate graphic representation in CAD, various command methods have been explored that increase the application's accessibility (such as AUTOLISP, which allows the use of personalized commands). This project presents an automation system based on Python that analyzes existing elements by extracting structured information (such as dimensions or coordinates) and reproduces the drawing, optimizing repetitive elements through predefined codes. The project's ultimate goal is to improve workflow efficiency, simplify the representation of complex layouts, enhance repeatability, and reduce manual intervention, being adaptable to various use cases within engineering and naval architecture environments.

Keywords: *automation, efficiency, algorithm, and data exchange*

27. (ID 149) Simulation of Spark-Ignition Engine Performance Using CyclePad

Authors: stud. Maria-Bianca SCURTU, stud. Cosmina BĂDĂRĂU

Scientific Advisors: Assoc. Prof. Rita AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This article highlights the essential importance of thermal engines in the economy and their impact on the environment, given their widespread use in transportation, industry, and energy production. Thermal engines convert thermal energy into mechanical energy by burning fuels such as gasoline, diesel, or gas. They are classified into two main categories: internal combustion engines and external combustion engines. The most common are internal combustion engines, in which the fuel is burned directly inside the cylinders to generate motion. In contrast, external combustion engines use a separate heat source to produce steam or gas, which drives the system. Understanding the operating principles, operating cycles, and maintenance of these engines is crucial for improving efficiency and reducing their negative environmental impact. In this study, a simulation was performed on spark-ignition engines using CyclePad software, analyzing the variation of the compression ratio from 8 to 10. The results indicated a significant increase in efficiency as the compression ratio increased, due to the higher temperature and pressure during compression, which enhances the combustion process. Therefore, a higher compression ratio contributes to a more*

efficient use of thermal energy and a more effective conversion into mechanical work.

Keywords: *Heat engines; Operating principles; Fuel combustion; Efficiency.*

VII. SECTION: FUNDAMENTAL SCIENCES

Section Committee:

Chairman: Assoc. prof. Anda OLTEANU, PhD

Members: Lecturer Eleonora RĂPEANU, PhD

Lecturer Cristina TUDOR, PhD

Stud. Bianca-Gabriela ENE

Stud. Robert-Cristian ANGHEL

Stud. Eduard-Mihai COJOCARIU

Room: Lp-A5

1. (ID 15) Evolution of Troop Command. Analysis of Command Potential in the National Army in Line with European and Global Standards

Authors: stud. Iuliana LEUNTEAN, stud. Alexandru TANASIEV

Scientific Advisor: Alexandru TANASIEV

Institution: Military Academy

Abstract: *The evolution of command with troops reflects a continuous transformation of principles and methods of leadership, influenced by technological, doctrinal, and organizational advancements. From classical hierarchical command models, characteristic of conventional warfare, modern systems have shifted towards information-based networks and rapid decision-making. In the context of the National Army, an analysis of command potential in relation to European and global standards highlights progress in implementing NATO principles regarding interoperability, digitalization, and flexibility in command structures. However, challenges persist in terms of human resources, adaptability to new technologies, and alignment with global trends in hybrid warfare. The study underscores the need for continuous development of military leadership capabilities, investments in professional training, and modernization of command-and-control infrastructure to ensure full compatibility with allied forces and robust operational capacity in contemporary conflict scenarios.*

Keywords: *Military leadership, command and control (C2), interoperability, digitalization, NATO, military leadership, hybrid warfare, operational adaptability, European standards, doctrinal transformation.*

2. (ID 82) The Role of Artificial Intelligence in Detecting Military Explosives

Author: stud. Bianca-Gabriela ENE

Scientific Advisor: Lecturer eng. Cristina – Andreea TUDOR, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Artificial intelligence plays an important role in armed conflicts, providing the ability to analyze and understand certain situations and obtain detailed information on them. The use of AI in the detection of military explosives contributes to increasing the efficiency and safety of military operations. This paper explores the main types of military explosives and detection methods, including chemical, physical and biological technologies. Modern AI-based systems are also analyzed, such as drones equipped with multispectral sensors, autonomous robots and pattern recognition algorithms used to identify improvised explosive devices (IEDs). The MINER-AI case study combines drones with intelligent robots to detect and neutralize explosives in conflict zones. The results demonstrate a significant increase in detection rates, a reduction in analysis time, and a decrease in risks to military personnel.*

Keywords: *explosives, artificial intelligence, chemical analysis*

3. (ID 191) Temperament and skills evaluation criteria

Authors: stud. Maria-Teodora CUREA, stud. Cristian-Gabriel HRĂNICERU

Scientific Advisor: Assoc. Prof. Carmen-Luminița COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Effective personnel distribution in the military relies on a thorough understanding of individual temperament and its impact on performance across various specialties. This project explores temperament's role in military occupational classification, analyzing how psychological traits influence adaptability, decision-making, and operational effectiveness. By correlating temperament types with*

specific military roles, the research aims to enhance the selection and training processes, ensuring that personnel are assigned to positions that align with their innate strengths. Additionally, the study examines skill evaluation criteria used in modern military assessments, focusing on cognitive, artistic, physical, and psychological benchmarks.

Keywords: *temperament, military, skill evaluation, decision-making, effectiveness, cognitive*

4. (ID 192) The Military Personality – Relationships Between Personality Dimensions

Authors: stud. Florina MUSCA, stud. Monica TANASE

Scientific Advisor: Assoc. Prof. Carmen-Luminița COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation explores the core dimensions of military personality and how they interrelate. It covers classical personality theories, such as the theory of humors, and focuses on three key dimensions: temperament, character, and aptitude. It examines how these elements influence each other highlighting relationships like temperament-character regulation, character-aptitude synergy, and the impact of temperament on aptitudes. The presentation also includes a case study and concludes with a model of interaction between personality traits through hierarchy, compensation, mutual influence, and feedback mechanisms.*

Keywords: *personality, midshipmen, relation, character, temperament, aptitude*

5. (ID 205) Study of the Instability Behavior of Compressed Bars: Modeling and Simulation in MATLAB

Authors: stud. Bianca-Gabriela ENE, stud. Irina-Elena AXINTE, stud. Camelia-Georgiana ION

Scientific Advisor: Assoc. Prof. Eng. Mihai BEJAN, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project focuses on the development of a computational tool in MATLAB for the analysis and design of axially loaded bars, considering elastic instability – specifically, the buckling phenomenon. The application is based on the modeling of bar*

behavior under linear elastic conditions, utilizing Euler's theory for elastic buckling and design principles in accordance with Eurocode 3 (EN 1993). An algorithm is implemented to allow the user to input specific bar parameters (effective length, boundary conditions, modulus of elasticity, yield strength, and cross-sectional geometry) and obtain key results such as critical buckling load, reduction factor, utilization ratio, and the minimum required cross-sectional area. The tool includes options for selecting various cross-section types (rectangular, circular, I-section, U-section, etc.), and the results are validated against normative values. The application provides both numerical solutions and graphical representations illustrating the variation in stability with respect to bar length and support conditions, thereby enhancing the understanding of instability behavior in compressed structural elements.

Keywords: *elastic buckling, bar design, structural analysis, instability, critical load, cross-sectional efficiency*

6. (ID 219) MATLAB Tool for Estimating the Critical Buckling Force Based on the Deformation Regime

Authors: stud. Maria IVĂNESCU, stud. Ioana-Octaviana MĂNĂILĂ, stud. Andrada-Evelina ENE

Scientific Advisor: Assoc. Prof. Eng. Mihai BEJAN, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The paper presents a program developed in MATLAB for determining the maximum buckling force that can be sustained by a rectangular cross-section bar subjected to axial compressive loading. The program takes input from the user regarding the bar's geometric parameters, material properties, and support conditions, and automatically calculates the effective buckling length and slenderness ratio. Depending on the identified buckling regime (elastic, elasto-plastic, or pure compression), the program uses Euler's formula, one of the Tetmajer-Jasinski relations, or the yield stress, respectively, to compute the critical stress. Based on these values, it determines the maximum buckling force the bar can withstand, taking into account a specified safety factor. The program provides a useful and user-friendly tool for engineers to evaluate the load-bearing capacity of compressed bars, ensuring fast and accurate calculations in the analysis of structural stability.*

Keywords: MATLAB, program, buckling, bars

7. (ID 225) Electronic Circuit Simulator

Authors: stud. Cătălin-Ionuț BREZOI, stud. Ionuț-Alexandru CHICHELUȘ, stud. Emil-Gabriel CHICHELUȘ

Scientific Advisor: Lecturer Paul VASILIU

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project is about the development of an electronic circuit simulator inspired by Paul Falstad, made in TypeScript and focused on user interaction with elements such as resistors, capacitors, inductors, voltage sources, and opamps. The simulator provides an intuitive graphical interface for circuit construction and uses nodal analysis algorithms to compute electrical values. The goal of the project is to facilitate the understanding of fundamental electronics principles through an interactive and accessible platform.*

Keywords: *circuit simulation, node analysis, graphical user interface, electronic components, interactive learning, resistors, capacitors, inductors, voltage sources, logic gates*

8. (ID 227) Ray-Tracing BVH

Authors: stud. Cătălin-Ionuț BREZOI, stud. Răzvan-Adrian CIOBANU, stud. Sabin BURHALA

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project aims to implement an efficient 3D rendering method using the ray tracing algorithm accelerated by the Bounding Volume Hierarchy (BVH) structure. The project explores spatial and temporal optimizations provided by BVH to reduce ray-object intersection time. The result is a graphics engine capable of generating realistic images, with global illumination and physically accurate shadows, demonstrating the importance of spatial hierarchies in modern rendering.*

Keywords: *ray tracing, bounding volume hierarchy, 3D rendering, global illumination, spatial optimization, temporal optimization, physically-based rendering, ray-object intersection, computer graphics, realistic shading*

9. (ID 228) Fluid Simulation & Rendering

Authors: stud. Cătălin-Ionuț BREZOI, stud. Arthur CURTVELI, stud. Mario-Aurelian CIOCIA

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The project presents a method for simulating and rendering fluid behavior using physics-based models based on the Navier-Stokes equations and particle-based methods (SPH – Smoothed Particle Hydrodynamics). The developed system provides a computational framework capable of simulating complex fluid-environment interactions and visualizing them realistically through advanced volumetric rendering techniques. The project has applications in animation, video games, and scientific visualization.*

Keywords: *fluid dynamics, smoothed particle hydrodynamics, Navier-Stokes equations, volumetric rendering, particle systems, fluid simulation, real-time visualization, computer animation, scientific visualization, physics-based modeling*

10. (ID 229) Server Log Analysis System

Authors: stud. Cătălin-Ionuț BREZOI, stud. Andrei ISTRATE, stud. Andi-Ștefan CHIRU, stud. Ioan-Alexandru CAZACU

Scientific Advisor: Lecturer Paul VASILIU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project focuses on building a tool that automatically analyzes server log files to help identify unusual activity, track system performance, and understand user behavior. By using real-time processing algorithms, the system can detect errors, and dish out useful statistics and highlight important patterns. The goal is to make server management easier and more secure for IT teams and developers, especially in educational or small-scale environments.*

Keywords: *log file analysis, anomaly detection, real-time data processing, pattern recognition, IT infrastructure, security analytics, user behavior analysis, statistical reporting*

11. (ID 237) Modeling Turbulent Flow in Constrained Spaces: Applications in Naval Propulsion System Design

Authors: stud. Fabiana-Andreea PUIU, stud. Robert-Emilian ȘPAN

Scientific Advisor: Assoc. prof. eng. Elena-Rita AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper aims to analyze fluid behavior under turbulent flow conditions within narrow geometries, with direct applications in the design and optimization of naval propulsion systems. It highlights the differences between laminar and turbulent regimes and the impact of turbulence on energy loss and hydrodynamic efficiency. Using the k - ε turbulence model, simulations of flow in ducts, nozzles, and cavities typical of propulsion systems are conducted. The distribution of velocity, pressure, and friction forces is analyzed. The goal is to identify geometric configurations that minimize losses and maximize efficiency. The study includes the interpretation of CFD simulation results and proposes potential improvements to existing systems. Practical applications are relevant to naval engineering and the design of propellers or jet-guiding nozzles.*

Keywords: *Turbulent flow; Naval propulsion systems; Constrained geometries; k - ε turbulence model; CFD simulations; Hydrodynamic efficiency; Energy loss; Velocity distribution; Pressure analysis; Friction forces; Propeller design; Jet-guiding nozzles*

12. (ID 238) The Influence of Romania’s Geographical Space on Operational Design

Authors: stud. Alisia ZBUGHIN, stud. Nicola-Gabriela MIRION

Scientific Advisor: Prof. Mihai-Marcel NEAG, PhD

Institution: "Nicolae Bălcescu" Land Force Academy

Abstract: *In this paper we take a multilateral approach to operational design, depending on geographic factors. To achieve the proposed goals, we will identify the most effective ways to design military operations in correlation with the results of the analysis of the specific Romanian geographical environment. The design of military operations within the system of force planning and organization to achieve tactical objectives is a complex process involving stages of analysis, execution and evaluation. The methods and analysis tools used are specific to the field of military science and target the factors specific to the physical component of the operational environment at the tactical level (OCOKA), as well as the analysis from the perspective of mission determining factors (MIFT-TC).*

Keywords: tactical planning, operational space, operational design, geographical factors, analysis methods

13. (ID 261) The Resilience of Military During Military Operations

Authors: stud. Mihaela-Maria BAUER, stud. Clara-Georgeta LIȚU

Scientific Advisor: Assoc. Prof. Carmen-Luminița COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This research examines military resilience as a multidimensional psychological adaptation mechanism essential for operational effectiveness. The paper delineates a tripartite classification of resilience emotional, social, and cognitive and analyzes their manifestations within both individual contexts and military environments. Through a comprehensive theoretical framework, the study explores fundamental resilience concepts including adaptability, emotional regulation, social support, autonomy, and purpose orientation. The research evaluates phase-specific resilience-building interventions throughout military deployment cycles and examines evidence-based rehabilitation programs such as Comprehensive Soldier and Family Fitness (CSF2). Additionally, the paper proposes enhancements to existing psychological support frameworks through intervention personalization, continuous leadership training, technological integration, and systematic evaluation protocols. By illustrating resilience through compelling case studies, including historical exemplars like Ecaterina Teodoroiu, this research contributes to the evolving discourse on psychological fortitude in military contexts and presents actionable strategies for fostering adaptive capacities in military personnel during operational challenges.*

Keywords: resilience, military, psychological, training, operational challenges

14. (ID 265) Fighting PTSD From a Psychological Point of View in Military Operations

Authors: stud. Emilian DANCIU, stud. Gabriel-Marian LEIZERIUC

Scientific Advisor: Assoc. Prof. Carmen-Luminița COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Post-Traumatic Stress Disorder (PTSD) is a complex psychological condition resulting from exposure to traumatic events such as combat, disasters, accidents, or assault. It manifests through intrusive memories, avoidance, negative mood and cognition, and heightened arousal. Addressing PTSD requires understanding trauma's effects on the brain and behavior, alongside evidence-based therapeutic approaches tailored to individual needs. Cognitive Behavioral Therapy (CBT) is one of the most supported interventions, helping patients reframe distorted trauma-related thoughts. Eye Movement Desensitization and Reprocessing (EMDR) has also proven effective, particularly in facilitating emotional processing. Mindfulness-based therapies enhance present-moment awareness and reduce anxiety, equipping individuals with tools to manage overwhelming emotions. Early intervention, psychoeducation, and community support are crucial for both prevention and recovery. Fostering psychological resilience, strengthening social connections, and aiding in meaning-making processes are vital for long-term healing. This paper emphasizes the importance of a multidimensional, compassionate approach to PTSD treatment one that combines clinical techniques with empathy and cultural sensitivity to support sustained recovery.,*

Keywords: PTSD, resilience, emotion, social connections, therapies

15. (ID 275) Communication Between Prison Officers and Inmates

Author: stud. Oana MĂRGINEAN

Scientific Advisor: Police Chief Victor DRĂGHICI

Institution: “Alexandru Ioan Cuza” Police Academy

Abstract: *Communication between a prison officer (or correctional officer) and an inmate can be difficult for several reasons, but the level of difficulty depends on the context, the officer's experience, and the inmate's profile. Inmates are often in a state of shock, going through an adaptation process to the prison environment, which places them in a category of vulnerable individuals with whom prison officers must communicate with great care. The psychological state of inmates at the time they are deprived of their freedom is highly sensitive, making them prone to unpredictable reactions and easily*

triggered conflicts. To prevent or manage such conflicts, prison officers carefully apply communication techniques.

Keywords: *Communication, conflicts, inmate, psychologic, reactions*

16. (ID 277) The Impact of Weather Phenomena on the Human Psyche

Authors: stud. Mihai-Cătălin CRĂCIUN, stud. Cosmina-Elena STĂICUȚ

Scientific Advisor: Lecturer Mihaela GURANDA, PhD

Institution: “Henri Coanda” Air Force Academy, Braşov

Abstract: *This paper explores the impact of meteorological phenomena on the human psyche in two distinct geographic contexts in Romania: the mountainous and coastal areas. The study aims to highlight how weather conditions in these regions influence the psychological well-being of residents, with a particular focus on seasonal depression and other weather-related affective disorders. Meteorological phenomena specific to each area, such as long, cold winters in mountainous regions or sea breezes and extreme heat in coastal areas, are analyzed from a psychological perspective, considering their impact on human behavior. The case study compares the psychological responses of inhabitants from both areas, using a questionnaire applied to a group of 20 participants (10 from the mountainous area and 10 from the coastal area). The results indicate significant differences in how these phenomena affect mood and mental health, offering valuable insights for improving the management of weather-related impacts on the human psyche in various regions of Romania.*

Keywords: *meteorology, phenomena, human psyche, affective disorders, seasonal depression*

17. (ID 286) The Role of Marine Chemistry in the Development of Alternative Energy Sources

Authors: stud. Antonia Laura RISTEA, stud. Dora Adia MIHU

Scientific Advisor: Lecturer eng. Cristina- Andreea TUDOR, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Marine chemistry plays a vital role in the development of alternative energy sources by harnessing the renewable resources of the oceans, thereby helping to reduce environmental impact. At the*

same time, it contributes significantly to various fields, such as marine biofuels and ocean thermal energy conversion. For instance, marine biofuels produce bioethanol and biodiesel with sodium ions, offering a more cost-effective and environmentally friendly alternative to lithium batteries, while ocean thermal energy exploits the temperature gradients between different ocean layers to generate electricity. This paper aims to highlight the role of marine chemistry in the development of sustainable energy solutions through modern technological innovations and its contribution to creating a cleaner, less polluted environment.

Keywords: *alternative energy, bioethanol, biodiesel, lithium batteries, marine biofuels*

18. (ID 288) “A Study on Ship’s Stability on Waves”

Authors: stud. Emir SALI, stud. Andrei VELICA

Scientific Advisor: Assoc. prof. eng. Elena-Rita AVRAM, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project looks into how stable a ship is when it moves on waves, focusing on how different sea conditions affect its balance and overall performance. It explores how the ship reacts to motions like rolling and pitching, and how things like the shape of the hull, how the weight is spread out, and where the center of gravity is, all play a role. A small-scale model was tested in a wave tank to simulate real sea conditions and see how the ship behaves. The results were then compared to theoretical predictions to check how accurate the model was and to figure out which factors have the biggest impact on stability. The project offers useful insights into how ship designs can be improved to make them safer and more efficient in real-life situations.*

Keywords: *Ship stability, roll and pitch, hull design, weight distribution, sea conditions*

19. (ID 295) The Role of Mathematics in Filmmaking

Authors: stud. Raluca COTORCEA, stud. Laura IORDAN

Scientific Advisor: Lecturer Eleonora RÂPEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Behind computer-generated imagery (CGI) are complex algorithms that use linear algebra to manipulate 3D objects and*

Bézier curves to create smooth animations. Practical effects, such as explosions or bullet trajectories, rely on precise mathematical equations that ensure both realism and safety on set. But math doesn't just build impossible scenes it arranges them beautifully. Directors like Wes Anderson use the golden ratio and symmetry to craft memorable frames that guide the viewer's eye and convey emotion. Advanced techniques like spline interpolation allow for groundbreaking camera movements, such as the iconic "bullet time" scene from The Matrix. From the smallest details to the grandest scenes, mathematics is the secret language of film, transforming abstract calculations into captivating visual experiences. It proves that behind every stunning shot lies a perfect harmony between art and science.

Keywords: *computer-generated imagery, golden ration, Bézier curves, mathematical equations, algorithms*

20. (ID 322) Mathematics in antiquity

Authors: stud. Ana-Maria ONOFREI, stud. Larisa UNGUREANU

Scientific Advisor: Lecturer Eleonora RÂPEANU, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Mathematics, as we know it today, has deep roots in ancient civilizations, where people began to develop logical methods to understand the world around them. This project traces the evolution of mathematics in three of the most influential cultures of antiquity: Egypt, Mesopotamia, and Greece. By analyzing the mathematical texts and symbols used in those times, the project highlights how practical needs – such as architecture, astronomy, or measurements – led to the emergence of fundamental mathematical ideas. These discoveries form the basis of scientific progress and reflect the ingenuity and abstraction capacity of the people of antiquity.*

Keywords: *Number systems, Papyrus scrolls, Egyptian mathematics*

21. (ID 335) How Manipulation Is Tackled in Crisis Situations

Author: stud. Vlad Ștefan NICHIFOR

Scientific Advisor: Lecturer Emil-Răzvan GÂTEJ, PhD

Institution: Police Academy "Alexandru Ioan Cuza"

Abstract: *In this paper we analyze how masses of people are influenced in situations of crisis, and then the research is narrowed down to individuals and how they act in their external context. In situations of uncertainty, fear and insecurity, individuals become susceptible to persuasive messages, propaganda and misinformation, which can lead to irrational decisions and polarization of public opinion. The study explores the dynamics of collective psychology: how beliefs are formed and manifested among large groups, alongside individual psychological reactions such as anxiety, the need to belong or obedience to authority. We aim to analyse methods of manipulation used in the media, as well as the reasons why they become credible among people, thus defying individual psychological defense mechanisms.*

Keywords: *crisis, propaganda, decisions, psychology, beliefs, masses*

22. (ID 340) Applied Mathematics in Naval Engineering

Authors: stud. Andrei-Valentin GURGU, stud. Ediz IUSMEN

Scientific Advisor: Prof. Dan LASCU, PhD Habil

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation explores the fundamental role of mathematics in naval operations, highlighting its application across naval architecture, engineering, and navigation. Key mathematical principles such as Archimedes' Principle, Bernoulli's Equation, Hooke's Law, and the Haversine Formula are examined in the context of vessel design, stability, propulsion, and positioning. Modern methods like Kalman filtering, Computational Fluid Dynamics (CFD), and Finite Element Analysis (FEA) are also discussed, emphasizing their contribution to safety, efficiency, and innovation in maritime technology. Through case studies such as the Costa Concordia disaster, the presentation underscores the necessity of accurate mathematical modeling in preventing failures and guiding future advancements. Mathematics proves to be not only a theoretical tool but a practical necessity in ensuring robust and intelligent naval systems.*

Keywords: *Naval Engineering Mathematical Modeling Maritime Safety*

23. (ID 347) Investment Banking Math

Authors: stud. Aurelian-Emanuel OLARU, stud. Darius TICULEANU

Scientific Advisor: Prof. Dan LASCU, PhD Habil

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project is about how math is used in investment banking and why it's not as hard as people think. It explains how you can get money to invest, like through a loan, and how to understand the payments you'll make over time using formulas. It also shows how to invest in stocks, calculate your profits, and handle losses in smart ways. Some important formulas like ROI (return on Investment), monthly payment, and stop-loss are explained in easy terms. The goal of this project is to help people realize that you don't need to be a math expert to start investing, you just need to understand a few key ideas and tools. With fun facts and useful tips, it makes learning about investing fun and easy to understand.*

Keywords: *Investment Banking*

24. (ID 352) Modeling and Simulation of a Maneuvering Ship

Author: stud. Dragoș OCU

Scientific Advisor: Prof. Dan LASCU, PhD Habil.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The research done to create a mathematical model describing ship maneuvers exists to become part of an interactive real-time simulation system. The research includes both theoretical aspects and practical implementation steps together with the achieved results. The ship motion model treats individual forces separately before combining them through the principle of superposition.*

Keywords: *ship dynamic modeling, real-time interactive simulation, hydrodynamic model, added inertia*

25. (ID 358) Mathematical Foundations of Naval Cryptography and the Case of Enigma

Authors: stud. Vlad-Teodor NICU, stud. Gigi-Robert-Cristian NUȚU

Scientific Advisor: Prof. Dan LASCU, PhD Habil

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project aims to explore the fascinating intersection between mathematics and maritime cryptography, whilst focusing on the use of the Enigma machine by German naval forces during WW2. Mathematical concepts such as permutations, combinatorics, and probability played a crucial role in encrypting and deciphering secret military messages. The breaking of Enigma is presented as a milestone in both mathematics and warfare. This presentation highlights the power of mathematics not only as a theoretical tool but also as a practical force that changed the course of history. Finally, it looks toward the future, considering the potential impact of quantum computing and advanced algorithms on naval cybersecurity.*

Keywords: *cryptography, naval communication, encryption*

26. (ID 380) Comparative Analysis of Combat Dynamics Using the Lanchester Warfare Model

Author: stud. Valentin-Marian SÂNDULESCU

Scientific Advisor: Lecturer Bogdan MUNTEANU, PhD

Institution: "Henri Coanda" Air Force Academy

Abstract: *This paper aims to comparatively analyze the evolution of combat actions between two opposing forces through the application of the Lanchester mathematical model. The two main variants of the model the square law and the linear law are investigated based on the tactical characteristics of the confrontation (modern long-range warfare vs. close combat or fighting in fragmented terrain). Through numerical simulations and hypothetical scenarios, the study highlights how factors such as initial troop strength, rate of fire, weapon efficiency, and chosen strategy influence the outcome of the engagement. The research provides a quantitative perspective on the dynamics of battles and emphasizes the importance of numerical and technological superiority in modern warfare, as well as the limitations of the Lanchester model in real-world operational contexts.*

Keywords: *Lanchester Model, Combat Dynamics, Numerical Simulation, Military Strategy*

27. (ID 388) Brussels' Skew Sphere

Author: stud. Mihai-Marian GHIOCEL

Scientific Advisor: Assoc. prof. Anda OLTEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The Atomium, a symbol of Belgium created for the 1958 World's Fair by André Waterkeyn, was restored in 2004-2006. During this process, one of the nine spheres representing an iron crystal was covered irregularly, presenting a deformed hexagon and trapezoidal shapes instead of the expected ones.*

28. (ID 427) The Golden Ratio vs Fibonacci

Author: stud. Andrei Denis SARBU

Scientific Advisor: Assoc. prof. Anda OLTEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Spirals are universally admired for their beauty, yet little research has explored aesthetic differences among them. We compare the golden spiral, with its continuous curvature, to the Fibonacci spiral, which has a stepwise curvature. The results show that the golden spiral is preferred, supporting the idea that continuous curvature is more aesthetically pleasing. Additionally, the Archimedean spiral, with continuous curvature, was favored over the Dürer spiral, which has discontinuities.*

Keywords: *spirals, Fibonacci, golden*

29. (ID 428) Communication in Combat: The Impact of Stress and Interpersonal Relationships on Decision-Making Effectiveness

Author: stud. Cristian-Andrei CLOCOCOȚAN

Scientific Advisor: Lecturer Emil-Răzvan GÂTEJ, PhD

Institution: “Alexandru Ioan Cuza” Police Academy

Abstract: *In exceptional situations making simple decisions makes the difference between victory and defeat, life and death, joy or sorrow, and stress greatly influences the quality of thinking. In this project, I propose to analyze how stress impacts reasoning, as well as how interpersonal relationships between team members can reduce or amplify the psychological pressure experienced. The analysis combines perspectives from psychology, communication sciences and group dynamics to highlight the importance of trust, empathy and cohesion in decision-making processes. Thus, the paper points out that it is not only strategies or protocols that matter in*

battle, but also the quality of human connections, an often-underestimated factor, but one with a major impact on performance and safety.

Keywords: *Stress, decisions, thinking, interpersonal relationships, trust*

30. (ID 430) Inertial Navigation for Underwater Drones: Modeling Positioning Errors in the Absence of GPS

Author: stud. Sandu George-PETRUT

Scientific Advisor: Lecturer eng. Elena ROBE-VOINEA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *In underwater operations, Global Positioning System (GPS) signals cannot penetrate the aquatic environment, making conventional navigation methods unusable for Autonomous Underwater Vehicles (AUVs). This paper focuses on inertial navigation as a self-contained alternative, using accelerometers and gyroscopes to estimate the position and orientation of underwater drones. A mathematical model is developed to describe the integration of inertial sensor data over time, with a particular emphasis on how sensor noise, bias, and drift impact positioning accuracy. Simulations demonstrate how small measurement errors accumulate into significant deviations from the true trajectory. The results highlight the critical need for accurate error modeling and correction strategies, such as sensor fusion with acoustic or visual systems, in order to maintain reliable navigation over extended periods. This study provides a foundation for future developments in autonomous navigation in GPS-denied underwater environments.*

Keywords: *Inertial navigation, underwater drones, positioning error, sensor drift, GPS-denied environment*

31. (ID 432) Sum of Primes in Odd Numbers

Author: stud. Marius Gabriel MIERTOIU

Scientific Advisor: Assoc. prof. Anda OLTEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *We will analyze various proofs of the theorem stating that the sum of the first n odd numbers (starting from 1) is equal to n^2 . It presents inductive, algebraic, linear system, generating function, and advanced techniques, highlighting the connections among*

fundamental mathematical concepts and effectively combining intuitive understanding with mathematics.

32. (ID 437) Procrastination Among Students

Author: stud. Daniel-Iustin CORCIOV

Scientific Advisor: Lecturer Luciana TALMAȚCHI, PhD

Institution: "Nicolae Bălcescu" Land Force Academy, Sibiu

Abstract: *This study examines procrastination among military and civilian students, addressing its definition, prevalence, and influencing factors. Procrastination is defined as the act of delaying tasks, often due to avoidance, and is considered a common behavior, with approximately 25% of adults identifying as procrastinators. The extent of procrastination varies across different life domains, including academic, work, and personal life. In the workplace, procrastination is linked to negative consequences for both the individual and the organization, with significant financial losses attributed to personal activities and non-work-related internet use during work hours. The study identifies two main types of procrastination: active procrastination, where tasks are intentionally delayed to leverage the perceived efficiency of working under pressure, and passive procrastination, characterized by the postponement of tasks due to difficulties in planning and initiating action. Several factors contribute to procrastination, including lack of motivation, fear of failure, perfectionism, and poor time management. These factors can lead to various negative effects, such as increased stress, reduced quality of work, damaged relationships, hindered goal achievement, lost opportunities, and the development of a chronic procrastination habit. The research methodology involves a case study using a questionnaire to compare procrastination levels between military students from the "Nicolae Bălcescu" Land Forces Academy in Sibiu and civilian students from the University of Medicine and Pharmacy in Cluj-Napoca. The study includes an analysis of "soldiering" (reduced productivity) and "cyberslacking" (personal use of internet at work). The questionnaire employs a 4-point Likert scale to assess the degree of procrastination among participants.*

Keywords: *study, procrastination, efficiency*

33. (ID 455) The Science that Scares. Social Fear Generated by Scientific Innovation in the Digital Age

Author: stud. Dora-Elisabeta LINGVAI

Scientific Advisor: Assoc. Prof. Police Chief Filip BACALU, PhD

Institution: “Alexandru Ioan Cuza” Police Academy

Abstract: *Advancements in fundamental sciences such as physics, chemistry, biology, and mathematics have a significant impact on modern life. However, many of these innovations are often met with fear, distrust, or confusion by the general public. Fear of science is frequently fueled by a lack of accurate information and the spread of misinformation, especially through social media and mass media.*

This paper aims to analyze how fear and misinformation influence public perception of scientific progress. Through a questionnaire applied to a diverse sample, we will explore the level of scientific literacy, sources of information, trust in various scientific fields, and attitudes toward innovation.

Keywords: *Fundamental sciences, fear, misinformation, social media, AI*

34. (ID 467) Resilience as a Mediating Factor in Interpersonal Conflicts within Groups of Military Students

Author: stud. Luana-Maria BULGAREA

Scientific Advisor: Assist. Prof. Maria-Lucia TALMAȚCHI, PhD

Institution: “Nicolae Bălcescu” Land Forces Academy of Sibiu

Abstract: *This article explores the role of resilience as a mediating mechanism in managing interpersonal conflicts within groups of military students. In an educational context characterized by strong hierarchical and disciplinary structures, interpersonal conflicts can negatively impact group cohesion and individual performance. The paper provides a critical analysis of existing literature on the relationship between resilience and conflict behavior, arguing that resilience operates through emotional regulation, cognitive reappraisal, and the activation of social resources. The study highlights the role of the military-educational environment in fostering resilience and concludes by emphasizing the importance of integrating resilience-building strategies into the psychological training of military students to reduce interpersonal tensions and enhance organizational effectiveness.*

Keywords: *resilience, interpersonal conflict, military students, group cohesion, mediation, psychological adaptation*

35. (ID 490) Development of an In-House Integrated Platform for Real-Time Naval Mine Detection and Threat Forecasting in Support of NATO SeaShield 25 Operations via UAV-USV Collaboration

Authors: stud. Iustin-Nicolae MOROȘAN, stud. Gabriel IOSIF

Scientific Advisors: Lecturer eng. Elena-Grațiela ROBE-VOINEA, PhD, SR2 eng. Oana MARCU, PhD, Prof. eng. Vasile DOBREF, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *An integrated platform has been designed and developed entirely in-house to enable real-time acquisition, processing, and visualization of data collected by coordinated Unmanned Aerial Vehicles (UAVs) and Unmanned Surface Vehicles (USVs). The system is platform-independent, ensuring compatibility with a wide range of autonomous maritime assets. Its core capabilities include the detection of naval mines and the forecasting of their potential movement based on environmental and navigational data. The solution is specifically tailored to support NATO’s SeaShield 25 operational scenarios and was developed under the ASMINES initiative.*

Keywords: *Machine Learning, AI, UAV, USV, SeaShield 25*

36. (ID 495) Conics and Quadrics in Everyday Life

Authors: stud. Paul-Cristian ACATRINEI, stud. Bianca-Elena ARNĂUTU

Scientific Advisor: Lecturer Eleonora RĂPEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Conic curves and quadric surfaces are essential in modeling both natural and artificial phenomena. In astronomy, they describe the trajectories of planets and satellites, and their equations allow for the calculation of key parameters for space missions. In physics, the parabola describes the trajectory of objects in free fall, being applicable in sports and digital simulations. In architecture and engineering, quadrics offer structural stability and efficiency, being used in the construction of cooling towers or complex roofs, as*

well as for optimizing acoustics and lighting in large spaces. In 3D graphics, quadric forms are used for object generation and realistic simulation of spatial interactions. In science and technology, quadratic functions are essential in optimization, artificial intelligence, and molecular modeling. Thus, these geometric forms have wide applications, demonstrating their importance in understanding the real and virtual world.,

Keywords: Geometry, Simulation, Optimization, Trajectory, Engineering

37. (ID 500) Mathematical Modeling of Triangulation and Localization in Maritime GPS Systems Using Linear Algebra

Authors: stud. Sebastian POPA, stud. David Ioan CĂLIN

Scientific Advisor: Prof. Dan LASCU, PhD Habil

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: This project investigates how GPS technology is used in maritime navigation to determine a vessel's position using triangulation and trilateration. The mathematical focus is on linear algebra, particularly systems of equations and matrix methods. We also explore sources of GPS error and discuss real-life applications such as route planning and navigational accuracy at sea.

Keywords: GPS Localization, Maritime Navigation, Triangulation, Linear Algebra Applications, Satellite Positioning, Navigation Error Correction, Matrix Systems in Navigation Position Estimation

38. (ID 112) The Language of Nature: Mathematical Applications in Physics

Authors: stud. Maria-Alexandra NISTOR, stud. Răzvan-Cristian VELIAN

Scientific Advisor: Lecturer Răpeanu Eleonora, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: Physics depends on mathematics because it uses this language to write down natural laws for analysis and comprehension. This presentation examines core mathematical concepts across physics branches, showing how they support key theories and phenomena. The predictive power of mathematical models becomes evident in Newton's laws, the law of gravitation, Maxwell's equations, and Schrödinger's equation. This presentation

demonstrates how algebra, geometry, calculus, probability, and statistics address actual physical problems in the real world. Examples such as force equations, energy transformations, wave functions, and matrix transformations in relativity demonstrate the connection.

Keywords: *Physics, Mathematical Concepts, Gravitation*

39. (ID 118) Hammer Juggling, Rotational Instability, and Eigenvalues

Author: stud. Iuliana HANGIU

Scientific Advisor: Assoc. prof. Anda OLTEANU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The rotational dynamics of asymmetric rigid bodies exhibit intriguing instability phenomena, notably exemplified by the behavior of a hammer undergoing free rotation. Experimental observations demonstrate that when rotation occurs about the axis associated with the intermediate principal moment of inertia, the orientation of the body undergoes pronounced deviations after a full revolution. This instability arises not from mass distribution per se, but from fundamental properties of the inertia tensor, specifically its eigenstructure. Through a rigorous application of Euler's equations for rigid body motion, it is established that perturbations around the intermediate axis grow exponentially over time, leading to rotational instability. This phenomenon holds significant relevance in the study of rigid body mechanics, spacecraft attitude dynamics, and offers a compelling, accessible illustration of abstract mathematical principles such as eigenvalue analysis and tensor theory.*

Keywords: *hammer, rotation, instability*

40. (ID 128) Sea Level Evolution in the Last 20 Years and Waterline Dynamics on the Romanian Littoral: Coastal Measurements and Protection Measures

Authors: stud. Sorin SCORUS, stud. Lia PASCARU

Scientific Advisor: Lecturer Lucian DUMITRACHE, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper analyzes the position of the waterline and the evolution of the mean sea level along the Romanian Black Sea coast, highlighting the need for accurate and continuous coastal*

monitoring. The coastline is divided into two sectors: the northern sector, stretching from the northern part of the Danube Delta to Cape Midia, characterized by natural beaches and wetlands; and the southern sector, from Cape Midia to Vama Veche, marked by cliffs, rehabilitated beaches, and significant human intervention. The waterline position was determined for the year 2024 based on geodetic field measurements performed using a GNSS (GPS) Rover RTK system. The collected data was processed and analyzed in a GIS environment, and the paper briefly presents how this equipment was used during fieldwork. The mean sea level was assessed over the period 2004–2024 using data provided by tide gauges and hydrometric stations, which will also be briefly described. The analysis reveals a consistent rising trend in sea level, emphasizing the need for coastal protection measures, such as beach rehabilitation projects, which are also discussed in this study. The results of this study highlight the usefulness of modern geospatial technologies in monitoring coastal dynamics. By combining field measurements with GIS analysis and long-term sea level data, the study supports the importance of continuing and expanding the coastal protection measures already implemented, such as beach rehabilitation, and emphasizes the need for ongoing monitoring of Romania's coastal zone.

Keywords: *waterline, Romanian coast, sea level, GIS, tide gauge, hydrometric station*

41. (ID 172) The Golden Ratio: Timeless Harmony in Design

Authors: stud. Dan-Andrei PĂTRAȘCU, stud. Andreea SCARLAT

Scientific Advisor: Lecturer Repeanu Eleonora, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper examines the Golden Ratio as a mathematical concept with deep roots in geometry and number theory, and its presence in both nature and human-made design. Found in spiral galaxies, seashells, and plant growth patterns, the ratio also influences art, architecture, and branding. The study explores its mathematical foundation, aesthetic appeal, and enduring role in connecting science with visual harmony.*

Keywords: *Golden Ratio, mathematics, nature, design, geometry, aesthetics, harmony*

VIII. SECTION: FOREIGN LANGUAGES

Section Committee:

Chairman: Assoc. prof. Laura CIZER, PhD

Members: Lecturer Camelia ALIBEC, PhD

Lecturer Corina SANDIUC, PhD

Lecturer Raluca APOSTOL-MATEȘ, PhD

Stud. Ioana ISOPESCU

Stud. Evelin OPREA

Stud. Andrada-Evelina ENE

Stud. Larisa GRECU

Room: CI S3

1. (ID 3) Abraham Lincoln – A Leader of a Broken Nation

Authors: stud. Denis-Ionuț-Cătălin CHIRIȚĂ, stud. Valentin-Daniel SMEIANU

Scientific Advisor: Assoc. Prof. Brândușa-Oana NICULESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *In a country that has known remarkable leaders such as George Washington, Thomas Jefferson and Franklin D. Roosevelt, stands tall among these great colossuses an honest lawyer who through his leadership qualities has managed to change the destiny of the United States of America and to make his mark on the history of the world in which we live. Abraham Lincoln was an important political figure of the 18th century who made a name for himself during his years as President of the United States. A man who stood up for what was right, Honest Abe was forced to take part in the bloodiest conflict in US history, known as the Civil War. Lincoln had an important mission to fulfill: to preserve the territorial integrity of the young state that not long before had gained its independence. He also fought for a noble goal: the abolition of slavery, a dark stain that had plagued civilization for thousands of centuries. Although unfortunately he left this world abruptly and was unable to enjoy his accomplishments, the legacy that The Ancient One has left is one that will endure for eternity This work aims to illustrate the achievements*

that Abraham Lincoln had through his leadership qualities, but also the legacy he left behind the American Civil War

Keywords: *President, Civil War, slavery, leadership qualities, legacy*

2. (ID 4) RICHARD WINTERS – A Story of Leadership

Authors: stud. Dumitru-Andrei DOBROMIR, stud. Marian-Valeriu RAUCA

Scientific Advisor: Assoc. Prof. Brândușa-Oana NICULESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Major Richard “Dick” Winters represents a key figure in World War II as the commander of the Easy Company (101st Airborne Division), the distinguished company that marched from Normandy through the German lines, all the way to the Eagle’s Nest. He exemplified an extraordinary leadership style rooted in decency and adaptability. His approach to leadership was characterized by leading by example, meticulous preparation, and fostering trust and respect within his men. Winters emphasized the importance of discipline and communication. Winters’ ability to remain calm under pressure and to make decisive decisions earned him the unwavering loyalty of his men. He demonstrated a people-centered leader mindset, prioritizing the well-being of his troops while holding them to high standards of performance. Major Winters’ leadership style provides a timeless example of how integrity, preparation, and a focus on teamwork can achieve extraordinary results in the most challenging circumstances*

Keywords: *leadership, “Follow Me!”, WWII, 101st Airborne, American military culture*

3. (ID 9) Henry VIII – Architect of Power and Military Legacy

Authors: stud. Gabriel MANOLACHE, stud. Mihaela PÎRVU

Scientific Advisor: Assoc. Prof. Brandusa-Oana NICULESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Henry VIII stands as a formidable figure in the history of the Tudor Monarchy, renowned for his commanding leadership and strategic pursuit of military power. His reign was marked by significant military reforms, including the establishment of a professional navy that became the cornerstone of England’s defense and expansionist ambitions. Through calculated campaigns and*

fortification projects, Henry reinforced England's borders and asserted dominance on the European stage. Simultaneously, his marital politics became a tool of both personal and political strategy, shaping alliances and fueling internal transformations. The King's religious transformation, exemplified by the break with the Catholic Church and the establishment of the Church of England, further consolidated his authority and redefined the monarchy's relationship with religion. By uniting military strength, political consolidation, and ideological shifts, Henry VIII solidified his legacy as a ruler who wielded power with unrelenting determination and reshaped the future of England.

Keywords: *Tudor monarchy, marital politics, religious transformation, military power, military reform, political consolidation*

4. (ID 17) The Rise of the British Empire: From Sea Power to Global Dominance

Author: stud. Cosmin-Daniel MOCANU

Scientific Advisor: Lecturer Lucia-Larissa MORAR, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *The Rise of the British Empire: From Sea Power to Global Dominance* explores how Britain transformed from a maritime power into the world's most extensive empire. It highlights the strategic role of naval supremacy in securing trade routes and colonies, which facilitated Britain's economic and political control across continents. The book traces key historical events, including the defeat of rivals, technological advancements, and the role of influential leaders, which led to Britain establishing its dominance in global affairs. It provides insight into the empire's global influence, from its military conquests to the cultural and economic exchanges that shaped the modern world.

Keywords: *British Empire, Sea Power, Global dominance, Empire, History*

5. (ID 18) George Washington-Leadership, Legacy, and the Birth of a Nation

Authors: stud. Florian-Gheorghe POPA, stud. Dennis-Nicolae ANTONIE

Scientific Advisor: Assoc. Prof. Brandusa-Oana NICULESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *George Washington (1732-1799) is celebrated as one of the most pivotal figures in American history. His leadership during critical moments, including the American Revolution and his presidency, cemented his reputation as a unifying force for the nascent United States. This paper examines three key aspects of Washington's life: his early development and military career, his strategic command during the Revolutionary War, and his presidency, which laid the foundation for the nation's political system. By delving into his ability to inspire loyalty, his vision for a democratic government, and his decision to step down after two terms, this paper highlights Washington's role as a statesman and a symbol of American ideals. His legacy continues to resonate as an enduring example of leadership, resilience, and dedication to public service.*

Keywords: *president, constitution, leadership, founding fathers*

6. (ID 26) Paws on the Frontline

Authors: stud. Gabriel BACTER, stud. Dumitru Eduard MIHALACHE

Scientific Advisor: Assoc. Prof. Brandusa-Oana NICULESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract *The evolving nature of modern warfare and security challenges has necessitated innovative solutions to enhance mission success and protect human lives. Among these solutions, special operations dogs have proven to be a game-changing asset, combining natural instincts with advanced training to perform critical roles in high-stakes environments. These dogs, often referred to as military working dogs (MWDs), are carefully selected through a rigorous breeding process that prioritizes intelligence, physical endurance, and a balanced temperament. Once chosen, they undergo intensive training programs designed to hone their skills in areas such as explosive detection, suspect apprehension, and search-and-rescue operations. Their training often parallels the demanding regimens of elite special operations units, preparing them to operate in diverse and unpredictable conditions, from urban combat zones to remote wilderness areas. In operational settings, special operations*

dogs provide a unique edge by leveraging their acute senses and agility to detect threats, locate targets, and protect personnel. Their ability to perform under extreme pressure not only increases mission efficiency but also reduces risks to human operators. Beyond their tactical contributions, these dogs foster a sense of camaraderie and morale among their handlers and units, further enhancing team cohesion.

Keywords: Warfare, special operation dogs, breeding, training, combat

7. (ID 28) The Concept of Psychological Resilience

Authors: stud. Maria-Ramona ENACHE, stud. Mirela-Andreea CAZAN

Scientific Advisor: Assoc. Prof. Carmen COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Psychological resilience is a complex set of skills and strategies that help individuals cope with life's challenges and adversities. It includes components such as emotional, cognitive, behavioral, social, moral, and spiritual resilience, each playing a crucial role in adaptation and recovery in the face of difficulties. Developing resilience involves managing emotions, modifying thinking, adopting healthy habits, maintaining supportive relationships, upholding personal values, and finding meaning in life. These strategies not only allow individuals to survive stress but also promote continuous personal growth, turning challenges into opportunities for development.*

Keywords: Psychological resilience, Emotional, Cognitive, Behavior, Social, Moral, Spiritual

8. (ID 36) Stealth Technology in the Military Navy: Invisible Ships of the Future

Authors: stud. Andreea TOMA, stud. Raluca SOARE

Scientific Advisor: Lecturer Dana ZECHIA, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Stealth technology has revolutionized the military field, allowing naval forces to operate invisibly to enemy radars. Initially applied in aviation, it was also integrated into warship construction, changing maritime.*

Keywords: *Stealth technology, Naval forces, Radar detection, Warships, Strategic advantages.*

9. (ID 41) Wax, Fame and History: The legacy of Madame Tussauds.

Authors: stud. Andreea-Mariana CORA, stud. Andra-Cristina GRIGORUȚA

Scientific Advisor: Assoc. prof. Lica Gabriela MIHAILA, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *The most famous wax museum in the world, and the oldest, Madame Tussauds in London was founded in 1835 by the French sculptor Marie Tussaud and has evolved from a small collection of wax figures into a world-renowned museum. This project examines the fascinating history of the museum, which has its roots in the period of the French Revolution, when Marie was forced to create death masks for famous victims, including Louis XVI and Marie Antoinette. In this context, the paper explores the evolution and cultural impact of the Madame Tussauds Museum, highlighting its role in preserving the legacies of both historical and contemporary figures. Today, there are over 20 Madame Tussauds museums around the world, but the focus of this work will be on the one in London, where over 250 wax figures are displayed. Through a detailed analysis of the meticulous process behind each wax figure, which requires months of work and attention to the smallest details, this project underscores how the museum offers a journey through history, preserving the memory of leaders, artists, and defining events. Madame Tussauds is not just a museum, but an immersive experience, serving as a major tourist attraction. It is based on interactive exhibits and virtual reality, allowing visitors to feel part of the world of the greatest celebrities. By combining entertainment with historical education, the museum remains a place where history and fame are not only reflected in wax but preserved for eternity.*

Keywords: *wax, museum, legacy, meticulous process, personalities, historical education, London.*

10. (ID 42) Traditions and Customs of Ireland

Authors: stud. Stefan-Robert UNGUREANU, stud. Hristofor BIBELEA

Scientific Advisor: Assoc. prof. Gabriela MIHAILA-LICA, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Ireland's rich cultural heritage is deeply rooted in its traditions and customs, which have been passed down through generations. This paper explores the most significant Irish traditions, including ancient Celtic rituals, religious celebrations, and social customs. Key aspects such as St. Patrick's Day, traditional Irish music and dance, storytelling, and Gaelic language preservation are analyzed to highlight their role in shaping national identity. The study also examines the influence of historical events on contemporary customs and the importance of preserving these traditions in the context of globalization. By understanding Ireland's customs, we gain valuable insight into the country's cultural identity and its connection to both the past and present.*

Keywords: *Ireland, traditions, customs, cultural heritage, national identity*

11. (ID 43) Historical Examples of the Importance of Linguistic Knowledge in the Military

Author: stud. Desislava MUSINSKA

Scientific Advisor: Raycho IVANOV

Institution: "Nikola Vaptsarov" Naval Academy

Abstract: *Throughout history, language has played a critical role in naval operations, diplomacy, and outsmarting opponents. Communicating effectively across language barriers has been essential for the success of numerous military missions and international alliances. (Tzu, 2024). This paper aims to showcase the immense importance of linguistic knowledge in all spheres of life, including the military. In the context of naval forces, language has served as a tool for strategic advantage and a means to navigate the complexities of cross-cultural engagement. One of the most notable examples of the importance of language in naval history is the use of Native American languages by the U.S. Navy during World War II and the role of foreign languages in Cold War naval intelligence operations. These instances illustrate how language can shape the outcome of maritime missions, influence military tactics, and contribute to the success of international cooperation. The materials used for data collection and analysis are studies, books, articles, and*

other secondary sources that provide the theoretical foundation or prior data on which the research is based. The analysis outlines the concept that historical evidence has consistently demonstrated that linguistic knowledge is a privilege and will always be one and that languages are not merely tools for communication but strategic assets in military operations.

Keywords: *importance of languages, history, military missions, intelligence operations*

12. (ID 46) Port of London

Author: stud. Andreea CĂCIULAN

Scientific Advisor: Assoc. prof. Gabriela MIHAILA-LICA, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *The Port of London has been a crucial center for maritime trade for centuries, playing a significant role in the economic development of the United Kingdom. Its origins date back to Roman times, when it served as a key trading hub, facilitating commerce between Britain and the rest of the Roman Empire. During the medieval period, the port continued to expand, supporting trade with Europe and beyond. However, it was during the British Empire's peak in the 18th and 19th centuries that the Port of London became one of the world's busiest and most influential ports. The construction of major docks, including West India, Royal Victoria, and Tilbury, enhanced trade efficiency and transformed London into a global commercial hub. The Industrial Revolution further strengthened the port's importance, supporting industries such as shipbuilding, warehousing, and manufacturing. However, in the mid-20th century, the rise of containerization and the need for larger port facilities led to the decline of inner-city docks. As a result, port activities moved downstream to modern facilities like Tilbury and London Gateway, ensuring continued competitiveness in global trade.*

Keywords: *Port of London, maritime trade, industrial revolution, logistics, inner-city docks, sustainability.*

13. (ID 61) The Cognitive Benefits of Learning Foreign Languages

Author: stud. Bogdan GRIGORE

Scientific Advisor: Assoc. prof. Laura CIZER, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Learning foreign languages offers a wide range of cognitive benefits that extend beyond linguistic proficiency. It promotes cognitive development by stimulating brain plasticity, which enhances the brain's ability to adapt and reorganize itself. This leads to improvements in memory, as language learners are required to store and recall new information frequently. Additionally, bilinguals exhibit stronger multitasking abilities, as switching between languages enhances cognitive flexibility and attention control. The process of learning and using multiple languages also strengthens problem-solving skills, fostering a more creative and adaptive approach to challenges. Finally, foreign language acquisition boost's executive function, including planning, decision-making, and task management, which are essential for daily life and complex cognitive tasks. Overall, the mental exercise involved in learning foreign languages enhances both the structure and function of the brain, offering long-term cognitive benefits.*

Keywords: *Cognitive development, Memory enhancement, Brain plasticity, Multitasking ability, Problem-solving skills, Executive function.*

14. (ID 65) Military Resilience as a Positive Psychological Adaptation During Military Operations

Author: stud Lia-Gabriela PASCARU

Scientific Advisor: Assoc. Prof. Carmen COJOCARU, Ph.D.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Psychological resilience is an individual's ability to cope with stress, adversity and change while maintaining emotional balance and functioning. It is influenced by internal factors, such as coping mechanisms and emotional intelligence, but also by external factors such as social support and life experience.*

Keywords: *Psychological resilience, stress, adaptability, social support, mental health*

15. (ID 66) "Unique" Languages and Their Specific Use

Authors: stud. Ioana-Mădălina SCÎRTOCEA, stud. Ștefan-Andrei DULEA

Scientific Advisor: Alina ONET

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *This presentation explores the concept of “unique” languages within the broader category of foreign languages, focusing on their specific applications in various fields. It examines how specializing in different idioms serve you as essential tools for precise communication and gives you a great advantage in unexpected, sudden affairs. Through real-world examples, we will highlight how these languages differ from general linguistic usage and their role in various contexts such as professional and academic encounters. The session concludes with insights into the importance of mastering specialized language for career advancement and cross-cultural collaboration.*

Keywords: *Abilities Communication Idiom Multilingual*

16. (ID 70) Maritime Accidents Caused by Human Error

Authors: stud. Faruk-Damian BUSEGEANU

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper speaks about maritime accidents, often resulting in severe environmental, economic, and human losses, are predominantly caused by human error, accounting for 75-96% of incidents. This study explores the key factors behind such accidents, including poor decision-making, crew fatigue, inadequate training, communication failures, and violation of safety procedures. A case study of the Exxon Valdez oil spill (1989) highlights how human errors such as exhaustion, navigational mistakes, and equipment failures can lead to catastrophic consequences. The impact of maritime accidents extends beyond immediate damage, affecting marine ecosystems, global trade, and economic stability. Preventive measures, including strict safety protocols, enhanced crew training, better working conditions, and improved communication, are essential in mitigating risks. This research underscores the urgent need for stronger maritime safety regulations and proactive risk management to minimize human-induced accidents at sea.*

Keywords *accidents, causes, ship, oil, error, safety, procedures*

17. (ID 72) The Importance of Draft Marks and Plimsoll Line

Authors: stud. Alessandro TOMA-LAVRIC

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This paper presents the development and significance of draft marks and the Plimsoll Line, pivotal innovations in maritime safety. Chapter 1 examines the invention of draft marks and the Plimsoll Line, detailing their origins and the role they played in ensuring the safe loading of ships. Chapter 2 explores into the various factors that led to their invention, including the growing concerns about overloading and the need for a standardized system to prevent maritime disasters. In Chapter 3, the focus shifts to the immediate impact these inventions had on sailors and navigators, highlighting how they helped prevent dangerous conditions at sea. Finally, Chapter 4 explores the long-term effects of these innovations on maritime safety, underscoring their continued relevance in modern shipping practices and their role in shaping global maritime regulations.*

Keywords: *Plimsoll Line, draft marks, invention, economic growth*

18. (ID 85) The Contrast Between the Traditional Image of Geishas and Their Reinterpretation in The Post-War Period

Authors: stud. Emmyly PAVEL, stud. Ariteea Maria ALBU

Scientific Advisor: Lecturer Diana-Annelisse SOPON, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Geishas have for centuries been a symbol of Japanese refinement and art, trained in tea ceremony (sado), traditional music (shamisen) and classical Japanese dance (nihon buyo). In the Edo period (1603-1868), they were respected as sophisticated entertainers and hosts, distinct from the oiran (high-ranking courtesans) of the yukaku (pleasure districts). Their image continued to be associated with elegance and discretion in the Meiji (1868-1912) and Taisho (1912-1926) periods. However, in the Showa period (1926-1989), especially after World War II and during the American occupation (1945-1952), the perception of the geishas changed drastically. The presence of American soldiers in Japan led to the emergence of the term panpan (women who provided sexual services to soldiers), and many Westerners began to confuse the geishas with these women, eroding their status. Films such as*

Sayonara (1957) and Memoirs of a Geisha (2005) helped perpetuate a distorted image, associating them more with exoticism and seduction than with tradition and art. This presentation analyzes the transformation of the image of geishas in the post-war period, the impact of American influence on Japanese culture, and efforts in the Heisei (1989-2019) and Reiwa (2019-present) periods to rehabilitate the profession. It will also explore how modern geisha (geiko, a term used in Kyoto) and maiko (apprentice geisha) maintain their relevance in a globalized Japan, balancing tradition with social change.

Keywords: Geisha, Cultural transformation, American occupation, Globalization, Japan.

19. (ID 90) China. the Economic Rise of the Sleeping Giant

Authors: stud. Vlad-Mihai CHELU, stud. Claudiu Emilian CURCA

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The rise of China in the last few decades represents the biggest shift in international commerce the modern world has yet seen. Once considered a dormant economic and manpower force, the Chinese sleeping giant has emerged as a dominant player with global ambitions - transforming itself from a weak underdeveloped nation into a powerful superpower almost on par with its rival, the United States. This article analyses the journey of China's economic rise from the first reforms of the 20th century to the economic and technological progress that followed and have given this country the appellation of "the factory of the world". It highlights the factors that fueled this transformation: government policy, population scale, foreign investment, and export-led growth while also addressing the social, environmental, and geopolitical challenges accompanying such rapid ascent.*

Keywords: *China, economics, economic analysis, geopolitics, international commerce*

20. (ID 91) Look Good, Feel Bad? The Dark Side of Fast Fashion

Authors: stud. Mircea DAVID, stud. Florentina Andreea BUCUR

Scientific Advisor: Lecturer Camelia ALIBEC, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Fast fashion delivers trendy, affordable clothing quickly but at a high cost. It relies on exploitative labor, including poverty wages and unsafe conditions, and causes severe environmental harm through pollution, excessive water use, and high carbon emissions. Marketing tactics like FOMO and haul culture encourage overconsumption. While brands like Shein and H&M remain popular, sustainable alternatives such as ethical brands, thrifting, and upcycling offer solutions. Shifting consumer habits can reduce fast fashion's negative impact.*

Keywords: *labor exploitation, environmental damage, overconsumption, sustainability.*

21. (ID 95) The Man Who Almost Faked a Nobel Prize

Authors: stud. David-Alexandru MIHAILA, stud. Denisa STANCIUC

Scientific Advisor: Lecturer Diana SOPON, PhD

Institution: "Nicolae Balcescu" Land Forces Academy, Sibiu

Abstract: *The case of Jan Hendrik Schön is one of the most notable examples of scientific misconduct in contemporary physics. Between 2000 and 2002, while at Bell Labs, Schön published a series of widely celebrated papers claiming major breakthroughs in molecular electronics, including organic superconductors and molecular transistors. His work quickly gained international recognition and positioned him as a rising star in the field, with some even considering him a potential Nobel Prize recipient. Concerns arose when other researchers were unable to replicate his findings, prompting an internal investigation by Bell Labs. The resulting report revealed extensive scientific fraud: Schön had fabricated or manipulated data in at least 17 published papers. Among the most striking findings was the repeated use of identical graphs to represent different experiments, clearly indicating intentional deception. Though Schön never formally sought a Nobel Prize, the scientific community had placed him in serious contention due to the perceived significance of his research. The exposure of his misconduct not only led to the retraction of numerous articles but also sparked wider discussions on the reliability of peer review, the reproducibility crisis, and the pressures placed on researchers to publish high-impact results. Schön's case continues to serve as a*

stark reminder of the essential role of integrity and transparency in maintaining the trustworthiness of scientific research.

Keywords: *Scientific misconduct; Research fraud; Jan Hendrik Schön; Peer review ethics; Data fabrication*

22. (ID 102) Structure and History of DNA

Author: stud. Andreea-Alexandra GAVRILĂ

Scientific Advisor: Assoc. prof. Gabriela MIHĂILĂ-LICĂ, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *DNA (Deoxyribonucleic Acid) is the fundamental molecule that carries genetic information in living organisms. Its structure, a double helix, was first described by James Watson and Francis Crick in 1953, with significant contributions from Rosalind Franklin and Maurice Wilkins. DNA consists of two intertwined strands, composed of nucleotides, which include a phosphate group, a deoxyribose sugar, and a nitrogenous base. The nitrogenous bases adenine (A), thymine (T), cytosine (C), and guanine (G) pair specifically (A with T, C with G) according to Chargaff's rule, held together by hydrogen bonds, while the backbone is formed by sugar-phosphate bonds. The journey to discovering DNA's role as the genetic material spans from Friedrich Miescher's isolation of "nuclein" in 1869 to the landmark discoveries in the 1950s and 1960s, culminating in the completion of the Human Genome Project in 2003. DNA's discovery revolutionized fields such as genetics, evolution, genetic engineering, forensic science, and medicine, profoundly impacting research and applications in these areas. The motivation for writing about DNA stems from its central role in understanding life itself. Its discovery has opened doors to countless innovations in science and medicine, influencing not only our understanding of biology but also shaping technologies that have real-world applications, from disease diagnosis to genetic therapies. Given its profound impact on modern science, this topic offers a compelling and relevant exploration of how molecular biology continues to advance and transform the way we approach health, evolution, and even the very concept of life.*

Keywords: *DNA, Genetic information, James Watson, Evolution, Molecular biology.*

23. (ID 111) Make America Great Again?

Authors: stud. Laura IORDAN, stud. Raluca COTORCEA

Scientific Advisor: Lecturer Camelia ALIBEC, PhD.

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *"Make America Great Again?" means a lot of things, but did the U.S. truly change under Trump's leadership? This project explores Donald Trump's career trajectory from inheriting his father's business to becoming a dominant figure in real estate, known for bold deal-making and high-profile controversies. We try to examine his business successes and failures, media influence, legal challenges, and last but not least to analyze his transition from the corporate world to the presidency, highlighting how his leadership style and strategies shaped both his political image and the country's trajectory. Additionally, we explore how Trump's unconventional tactics redefined modern political campaigning. Furthermore, this project reflects on how his legacy continues to influence American politics and society today.*

Keywords: *leadership, business, controversies, media influence, presidency*

24. (ID 194) Airsoft for Beginners

Authors: stud. Vasile-Ionuț PAVĂL, stud. Paul-Alexandru CIOCAN

Scientific Advisor: Lecturer, Edith-Hilde KAITER, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Airsoft is an engaging and dynamic team-based activity that simulates military-style gameplay using replica firearms that shoot 6mm plastic BBs. For beginners, understanding the essential gear and safety rules is crucial for both enjoyment and safety. The only mandatory protective equipment is eye protection (eye-pro), which is vital to prevent serious eye injuries. Although optional, mouth guards offer valuable dental protection and comfort. Players use electric-powered replicas of real firearms, with the AR-15/M4 and AK-47 platforms being the most popular choices. These replicas require compatible magazines either mid-cap (spring-fed) or high-cap (winding-fed) as well as batteries and chargers. Ammunition consists of biodegradable or plastic BBs in varying weights, tailored to different replica specifications. Additional tools like BB loaders make magazine refills faster and more efficient. Accessories enhance*

the airsoft experience. Optical sights, such as red dots or scopes, improve aiming, while slings provide convenience during movement. Clubs that organize airsoft games provide rulebooks detailing match types, equipment limits, and safety regulations. Beyond the gear and rules, airsoft is about fun, creativity, and community. Players can express themselves through unique camouflage, themed outfits, or cosplay-inspired loadouts. Whether role-playing a soldier, a sci-fi character, or simply enjoying the sport with friends, airsoft offers a space to live out action-packed fantasies in a safe and structured environment. However, it's essential to always respect club rules to ensure a positive and injury-free experience for everyone involved.

Keywords: Airsoft, replica, AK-47, AR-15, team, self-expression, action, safe-environment, rules, basics, safety

25. (ID 203) “ChatGPT: a Blessing or a Curse?”

Authors: stud. Andreea-Gabriela NEAGU, stud. Constantin-Lucian CEPRAGA, stud. Larisa-Maria STAN

Scientific Advisor: Major Ana-Maria MERLUSCA

Institution: National Defence University "Carol I" Bucharest

Abstract: *This article takes a look at the two sides of ChatGPT, an advanced language model created by OpenAI. It has the potential to revolutionize education but also presents some academic and ethical obstacles. With insights from Stephen Wolfram, Maria Radeva, and Muhammad Abbas, we'll look into how ChatGPT operates, its advantages in educational settings, and what it means for students' minds and learning experiences. By examining this, we hope to figure out whether ChatGPT is a handy resource or if it brings along some hidden challenges for modern education.*

Keywords: ChatGPT, Generative AI, Education, Academic Integrity, Artificial Intelligence, Student Learning, Ethics, Language Model

26. (ID 232) The Green Illusion - Rethinking Sustainability in Shipping

Author: stud. Adrian-Alexandru DUNERAȘ

Scientific Advisor: Lecturer Corina SANDIUC, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The global shipping industry, responsible for over 80% of world trade, faces mounting pressure to reduce its environmental*

impact. While many companies promote sustainability initiatives, some engage in “false sustainability” or “greenwashing” techniques, exaggerating eco-friendly efforts while continuing harmful practices. This paper critically examines the disparity between claimed and actual sustainability in shipping, focusing on misleading strategies such as LNG adoption without accounting for methane slip, unverified carbon offsetting, and vague net-zero pledges. It also highlights weak IMO regulations, which allow companies to mislead the public about their sustainability efforts, resulting in adverse environmental, economic, and ethical consequences. The paper furthermore proposes solutions, such as stricter IMO regulations, transparent emissions reporting, and investment in zero-emission technologies like green hydrogen and wind-assisted propulsion.

Keywords: shipping industry, sustainability, greenwashing, environmental impact

27. (ID 235) Port of Piraeus

Author: stud. Ștefan PETRE

Scientific Advisor: Assoc. prof. Gabriela MIHĂILĂ-LICĂ, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *The Port of Piraeus is the largest and most important seaport in Greece and one of the busiest in the Mediterranean region. Located near Athens, it serves as a vital hub for maritime trade, passenger transportation, and logistics. Over the past decades, the port has undergone significant modernization and expansion, particularly following the investment and management by COSCO Shipping. Today, it functions as a key gateway connecting Europe with Asia, especially within the framework of China’s Belt and Road Initiative. This paper explores the strategic significance, economic impact, infrastructure development, and future prospects of the Port of Piraeus in the global shipping industry.*

Keywords: Port of Piraeus, maritime trade, Greece, logistics hub, COSCO, Belt and Road Initiative, Mediterranean shipping, port infrastructure, economic impact, transportation.

28. (ID 243) Cultural Appropriation vs. Cultural Appreciation in Language Learning

Author: stud. Maria RĂȚĂCIUC

Scientific Advisor: Assoc. prof. Isabela-Anda DRAGOMIR, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *In today's globalized world, the significance of understanding a culture is often underestimated in the process of language acquisition. This paper emphasizes the critical role that cultural awareness plays when engaging with a new language, arguing that neglecting this dimension can lead to superficial or even harmful interactions. While culture is often described as the heart of a nation a living repository of its values, identity, and history its vitality may fade over time, especially when it is misunderstood, misrepresented, or reduced to mere aesthetic elements. Surprisingly, individuals may unconsciously contribute to this erosion, regardless of their cultural background or intent. The present study seeks to clearly distinguish between cultural appropriation and cultural appreciation, not only from a semantic standpoint but also through the conceptual frameworks they represent. By offering precise definitions and contextual examples, the paper aims to encourage a more respectful and informed approach to cultural engagement, particularly in the context of language learning. Moreover, the analysis extends to both military and civilian environments, underlining the universal importance of cultural respect as an ethical imperative, irrespective of professional or social category.*

Keywords: culture, respect, learning, concept, informed

29. (ID 247) Inadequate Anchoring Practices and Their Impact: A Case Study of the Nomadic Milde

Authors: stud. Mihaela JIANU, stud. Robert Mihai DORNEANU

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *On May 8, 2020, the cargo vessel Nomadic Milde, anchored on the Mississippi River, dragged anchor due to strong currents, colliding with the bulk carrier Atlantic Venus and subsequently with a chemical dock. The incident caused \$16.9 million in damages and a spill of 50 liters of lubricating oil. The NTSB investigation identified several contributing factors, including*

the improper selection of the anchorage location, inadequate monitoring of the vessel's position by the crew, and ineffective use of the ECDIS system. Although both anchors were deployed, the length and positioning of the anchor chains did not provide sufficient holding power under the prevailing conditions. The crew failed to respond effectively to warning signals regarding the vessel's proximity to Atlantic Venus, and bridge coordination was poor. The lack of immediate action and insufficient training in position monitoring significantly contributed to the incident. The report highlights the need for rigorous preventive measures to avoid accidents caused by improper anchoring.

Keywords: *anchoring procedures, collision, anchor dragging*

30. (ID 255) Enhancing Communication Through Operational Multilingualism in Multinational Deployments

Author: stud. Ema IURIETI

Scientific Advisor: Prof. Mihaela Agata POPESCU, PhD

Institution: „Alexandru Ioan Cuza" Police Academy, Bucharest

Abstract: *Operational multilingualism is a fundamental principle for effective international cooperation in military missions, enabling clear communication, efficient operational coordination, and the building of trust among international partners. Proficient use of foreign languages allows for accurate observation of field situations, facilitates intercultural dialogue, and helps prevent misinterpretations that may affect tactical decisions. This paper examines the essential role of multilingualism in enhancing communication efficiency within international theaters of operation. It highlights key challenges, such as the lack of well-defined institutional frameworks for language training, resistance to adaptation in multilingual environments, and limited engagement of military personnel in specialized language programs. The study also proposes concrete solutions, including the development of coherent legal and educational structures, the integration of digital translation tools, and the strengthening of applied language training programs. By embracing these principles, military structures can reinforce international cooperation, improve operational safety, and support the development of efficient and responsible communication in joint missions.*

Keywords: *Interoperability Language Proficiency Cultural Intelligence Translation Technologies Strategic Communication*

31. (ID 268) The Many Faces of Spain: From Flamenco to Futurism

Author: stud. Andreea Grațîela GRIGORE

Scientific Advisor: Lecturer Diana SOPON, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Spain is a country known for various things. From the amazing culture, traditions, dances and food to the amazing sportsmen and discoveries, Spain is a country which has it all. Their lifestyle is something most people would wish for. In this presentation, I will present and discuss about some important aspects of Spain's evolution, such as historical, cultural, and medical development. Firstly, the paper will talk about their history, from the beginning of it until this point: from the first prehistoric paint found in a cave, to the Spanish Empire also called the "Christian Reconquest", up until the most recent aspects. It will mention many more aspects of their lives, the culture and traditions from back then and how they transformed into nowadays traditions. Secondly, the paper will present aspects about the Spaniards' culture. From the sports, dances and foods, Spain can be one of the most colored countries in the world when it comes to these aspects. Names in these aspects can be remembered as history makers in all these aspects. From football teams and players and tennis players, to even Formula One, Spain has lots of names which people are very fond of and heard of. Lastly, the paper will bring up medical development and how does technology affect it. From Spain's first medics and their discoveries to the most recent, mind-blowing discoveries which are taking place even as we are talking. To conclude what was said before, this paper aims to make us have a better understanding of Spain, their lifestyle and how much they contribute to the rest of the world.*

Keywords: *Spain, culture, traditions, medical, development*

32. (ID 269) "I, the One Behind the Military Uniform"

Authors: stud. George PETCU, stud. Andreea-Ysabela TRUȚESCU

Scientific Advisor: Lecturer Dana-Carmen ZECHIA, PhD.

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: „I, the One Behind the Military Uniform” explores the story of the young students at the "Mircea cel Bătrân" Naval Academy, who show that beyond the discipline and responsibilities of the military uniform lie individuals who are passionate and dedicated to their personal dreams. The presentation highlights how military discipline does not exclude the pursuit of passions, but can actually support them, providing a framework for the individual's harmonious development. The stories of students such as George Petcu, passionate about the accordion, Alexia Iosif and Mădălina Frăţilă, devoted to music, Mario Anghel, who loves art, and Andrei Lefter, passionate about Greek dance, are shared. Each of them offers an authentic perspective on how vocation and duty can coexist. In conclusion, the military uniform does not limit but strengthens passion, representing a symbol of courage and perseverance that helps these young people follow their dreams. In this way, a bridge is built between military duty and personal fulfillment.

Keywords: passion, art, music, dreams

33. (ID 283) Language Policy in the EU: Between National Identity and Integration

Authors: stud. Robert-Cristian BASARABA, stud. Mario-Alin ANTONOVICI

Scientific Advisor: Assoc. prof. Mimi-Carmina COJOCARU, PhD

Institution: „Alexandru Ioan Cuza" Police Academy, Bucharest

Abstract: "Language Policy in the EU: Between National Identity and Integration" explores one of the European Union's most unique and complex challenges: managing multilingualism in a way that respects both unity and diversity. The European Union is home to 24 official languages and countless regional and minority ones. For its citizens, language is more than a tool, it's a reflection of identity, culture, and national pride. At the same time, the EU must ensure clear communication and legal consistency across all member states, raising important questions: How do you write one law in 24 languages? And how do you balance fairness with efficiency? This presentation looks at the mechanism behind EU translation and interpretation, the symbolic and practical roles of dominant languages like English, and the tensions between protecting national

sovereignty and promoting European integration. By the end, we'll reflect on an essential idea: the European Union's linguistic diversity is not a weakness to be managed, but a strength to be embraced.

Keywords: *European Union, Europe, multilingualism, culture, linguistic diversity.*

34. (ID 292) Invincible No More: How the English Fleet Overcame the Spanish Armada

Authors: stud. Flavius LUPU, stud. Andrei-Alexandru BUZULOIU, stud. Alessio BULAI

Scientific Advisor: Assist. Prof. Alina-Elena ONET, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *This work examines the historic defeat of the Spanish Armada in 1588 by the English fleet, analyzing the key strategic, technological, and environmental factors that led to the downfall of what was considered an "invincible" force. By exploring naval tactics, ship design, leadership, and the critical role of weather, this study sheds light on how a smaller, more agile English navy outmaneuvered a larger and less flexible Spanish force. The analysis offers insight into early modern naval warfare and the shifting balance of power in 16th-century Europe.*

Keywords: *Spanish Armada, English Fleet, Naval Warfare, 1588, Maritime Strategy*

35. (ID 296) The Coandă Effect on Bow Thrusters

Author: stud. Elena STANCIU

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Like any other entity on Earth, the bow thruster is also obedient to the laws of physics, that govern our lives from behind an unseen veil. The bow thruster's purpose - lateral motion - is hampered, under certain conditions, by a series of phenomena, one of them being the Coanda effect. But how does it influence the motion of a bow thruster? The fluid flow interacts with the hull, curving around the surface and shaping the motion of the fluid that surrounds the hull. And understanding the physics behind it can help mitigate the negative effects, e.g. loss of lateral thrust and cavitation.*

Keywords: *Coanda effect, bow thruster, cavitation, pressure, fluid flow*

36. (ID 300) Types of Bows Used on Today's Ships

Author: stud. Dragos Marian BALUTA

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *The political context of the last century brought to the surface many important personalities who shaped the world as we detail about Churchill's life and political ascension, his leadership skills, and post-war global legacy.*

Keywords: *shipbuilding, bow, naval architecture*

37. (ID 317) Mystical Marine Creatures

Authors: stud. David Lorenzo CODREANU, stud. Bogdan Mihai BALCAN

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *In the dark depths of the ocean, legends speak of mysterious and terrifying creatures, symbols of the unknown and the unstoppable forces of nature. The Abyssal Leviathan, once a sea god, was cursed to guard an ancient treasure, while the Shadow Kraken hunts its prey with tentacles emerging from the darkness. The Bio-Mechanical Angler, a fusion of technology and biology, roams freely after escaping its creators' control. The Celestial Jellyfish lights the abyss with its translucent body, linking the earth to the cosmos, while the Phantom Eel brings misfortune and stirs storms. The Chrono-Sea Serpent drifts through time, guarding forgotten secrets, and the Siren Queen reigns with a voice that can command the seas themselves. These mythical beings inspire both awe and fear, portraying the ocean's depths as a realm of mystery, ancient powers, and unfathomable legends.*

Keywords: *The Abyssal Leviathan, The Shadow Kraken, The Bio-Mechanical Angler*

38. (ID 320) The Role of Foreign Languages in Military Careers: Strategic and Historical Perspectives

Authors: stud. Andreea-Suzana BOTGROS, stud. Paula Ancuța CADAR, stud. Marian-Daniel SOCOTEANU

Scientific Advisor: Major Assoc. Prof. Gabriela NICOARĂ, PhD

Institution: "CAROL I" National Defense University

Abstract: *Foreign language proficiency is a critical skill in modern military operations, offering both strategic and practical advantages. This paper explores the importance of foreign languages in the military, their role in career advancement, and their historical significance in intelligence operations. The exploration can be conducted through qualitative analysis combining literature review, historical case study evaluation, and assessment of military language training programs. Surveys or interviews with active military personnel can also be used. Expected results include identifying linguistic barriers and advantages in military operations, highlighting best training practices, and supporting policies that promote multilingualism as a strategic asset. Foreign languages enhance communication, cultural understanding, and operational efficiency. In multinational missions, such as NATO-led operations or peacekeeping efforts, language skills enable effective collaboration with allied forces and local populations. They also improve access to specialized training programs and career opportunities in diplomacy, intelligence, and international relations. Language skills are vital for intelligence gathering, de-escalating conflicts, and building trust with local communities. For example, during World War II, British intelligence relied heavily on translators to process intercepted communications and documents. Today, militaries worldwide invest in linguistic training to prepare personnel for diverse roles, from interpreters to cultural advisors. Throughout history, language proficiency has been a cornerstone of successful military strategy. Ancient Greek spies during the Peloponnesian War used bilingual operatives to gather intelligence. Similarly, during the Cold War, linguists played a crucial role in decoding enemy communications. These examples underscore the enduring value of language skills in military contexts. Foreign language proficiency is not just an asset but a necessity for modern military personnel. It enhances mission success, fosters international*

cooperation, and provides a competitive edge in career progression. As global security challenges evolve, investing in language training remains essential for operational readiness and strategic advantage.

Keywords: *foreign language, military careers, intelligence, multilingualism, international cooperation*

39. (ID 325) The History of QUEEN

Authors: stud. Ioana-Irina OLARU, stud. Ștefăniță-Valentin DINCĂ

Scientific Advisor: Assist. Prof. Alina-Elena ONETȚ, PhD

Institution: Land Forces Academy Sibiu

Abstract: *This project explores the legendary rock band QUEEN, their history, musical style, and impact on the music industry. We will present the band's beginnings and its members, followed by an overview of their most famous songs and albums. Additionally, we will discuss their unique sound, stage performances, and how they revolutionized rock music by blending different genres. The lead singer of the group is a remarkable and sometimes controversial figure, with an incredible life story! We hope you'll enjoy it!*

Keywords: *Queen, Freddie Mercury, Aids, legacy*

40. (ID 331) "Turn That Ship Around" – Leadership in Action

Author: stud. Alexandra-Ștefania ZAHARIA

Scientific Advisor: Assoc. Prof. Laura CIZER, PhD

Institution: "Mircea cel Bătrân" Naval Academy, Constanta

Abstract: *Leadership is a critical component in any organization, especially in high-stakes environments such as the military. Turn That Ship Around by David Marquet exemplifies how leadership transformation can create ownership, accountability, and sustainable improvement. This paper explores leadership dilemmas, unconventional leaders, and the COMPASS Leadership Model. By analyzing Marquet's leadership philosophy and its practical application, we gain insights into how effective leadership fosters a culture of empowerment and long-term success.*

Keywords: *leadership; empowerment; accountability; transformation; strategy*

41. (ID 361) Modern Maritime Piracy

Authors: stud. David-Andrei MOLOAGA, stud. Ștefan MATVEI

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This project examines contemporary maritime piracy as an evolving global security threat. Despite international countermeasures, piracy persists in key hotspots like the Gulf of Guinea and Strait of Malacca, using sophisticated tactics to target vessels and crews. The economic impact is substantial. Solutions require both security measures and addressing underlying socioeconomic causes in vulnerable coastal regions.*

Keywords: *Modern Maritime Piracy*

42. (ID 375) Winston Churchill - Military leader Without Weapons

Authors: stud. Cosmin PĂDUCEL, stud. Alexandru ANCU

Scientific Advisor: Assoc. Prof. Isabela-Anda DRAGOMIR, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Winston Churchill was a central leader during World War II, recognized around the world for his strong leadership and powerful speeches. His background in politics, writing, and military service prepared him to guide Britain through times of crisis. As Prime Minister, he inspired the British people with his determination and clear vision for the future. His speeches boosted national morale and gave people the strength to endure hardship. The purpose of this paper is to highlight Churchill's vital role in shaping public spirit, the influence of his words during the war, and his contribution to the development of the post-war world.*

Keywords: *Britain's wartime Prime Minister, writer, orator.*

43. (ID 382) Compulsory Military Service- A Solution for Educating the Youth?

Author: stud. Daniela TILĂ

Scientific Advisor: Assist. Prof. Alina-Elena ONETȚ, PhD

Institution: Land Forces Academy Sibiu

Abstract: *Compulsory military service can play a significant role in shaping the character and discipline of today's youth. In an era marked by a decline in civic values, a lack of structure, and growing individualism, military training offers a framework that promotes responsibility, respect, teamwork, and resilience. Young people are*

exposed to experiences that challenge both their physical and mental limits, encouraging personal growth and stronger social awareness. National identity and a sense of duty can also be reinforced through shared service. While critics argue that such programs may infringe on personal freedom or delay career paths, the benefits in terms of maturity, leadership, and civic education are notable. Countries with established conscription systems often report positive long-term impacts on youth behavior and social cohesion. Therefore, despite ongoing debates, mandatory military service remains a relevant and potentially effective tool in the holistic development of the younger generation.

Keywords: *Discipline, military training, respect, service, leadership.*

44. (ID 385) The American Dream: A Cultural Evolution Form Aspiration to Illusion

Authors: stud. Dragoș-Valentin ENE, stud. Maria-Ștefania ȘEITAN

Scientific Advisor: Assist. Prof. Alina Gabriela NEGOESCU, PhD

Institution: Land Forces Academy “Nicolae Bălcescu”, Sibiu

Abstract: *The American Dream, a long-standing cultural ideology, stands as a symbol of faith in progress and prosperity by being ambitious, initiative-driven, and hard-working despite social background. Historically rooted in the promise of equal opportunity, this paradigm has shaped personal aspirations and public policy alike. Nevertheless, considering that we are now in modern times, this term is being degenerated every day by institutional racism, socioeconomic stratification, and ineffectual public officials. Clear evidence, such as the increased violence and poverty, shows how the Dream has failed the American people and vice versa, turning this aspiration into an illusion. By analyzing data on specific topics monthly financial intake, hostile public behavior, and officials who exploit legal frameworks for personal or political gain we can clearly identify a widening gap between the American Dream and actual facts, revealing how the flawed system and beliefs have deteriorated its foundations. This paper explores, from a multidisciplinary perspective cultural, financial, and psychological how an empowering cultural ideology was twisted into an elusive and unattainable aspiration.*

Keywords: *culture, American, dream, illusion, ideology*

45. (ID 386) Women's Rights in the United States

Authors: stud. Andreea-Lucia CULBEC, stud. Emanuel-Nicol BUTNARIU

Scientific Advisor: Lecturer Diana SOPON, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Women's rights in the United States have evolved significantly throughout history, marked by constant struggles for equality, recognition, and social justice. Starting in the 19th century, women began mobilizing to claim essential rights such as the right to vote, education, and work. A prominent example is Susan B. Anthony, an activist who fought intensely for women's suffrage and played a decisive role in securing the right to vote through the 19th Amendment, adopted in 1920. Another key figure is Eleanor Roosevelt, former First Lady of the U.S., who played an essential role in promoting human rights, including women's rights, and served as a powerful voice within the United Nations. More recently, Ruth Bader Ginsburg, a Supreme Court Justice, had a major influence in the fight for gender equality through her legal decisions and her personal example of courage and perseverance. These female figures contributed not only to changing laws but also to shifting mentalities, inspiring entire generations to continue the fight for equal treatment between women and men in all areas of American society.*

Keywords: *Women's rights Equality Social justice 19th Amendment Susan B. Anthony Eleanor Roosevelt United Nations Ruth Bader Ginsburg Legal Decisions Empowerment Historical Figures Activism Law and policy Women's movement*

46. (ID 424) Rebel in Pearls: How Princess Diana Modernized Royal Fashion Identity

Author: stud. Denisa RADU

Scientific Advisor: Assist. Prof. Alina Gabriela NEGOESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *This presentation explores how Princess Diana redefined royal fashion in the late 20th century, transforming from a shy aristocrat into a globally recognized style icon. Through carefully curated wardrobe choices, Diana communicated emotion, independence, and modernity within a traditionally conservative*

monarchy. Her fashion evolution from romantic frills to sleek power suits mirrored her personal and public transformation, challenging rigid royal protocols and redefining what it meant to dress as a modern royal woman. Blending couture with accessibility, rebellion with elegance, Diana's style not only broke with royal tradition but also inspired a generation, influencing both high fashion and everyday wear across the globe. This study examines key looks, media representation, and cultural impact, positioning Princess Diana as a pivotal figure in the modernization of royal fashion identity.

Keywords: *cultural impact, royal fashion, british royalty, Princess Diana, symbolism in fashion*

47. (ID 442) Romania: A Journey Through History, Culture and Transformation

Author: stud. Robert-Iulian OLARU

Scientific Advisor: Lecturer Diana SOPON, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *When we hear of Romania, lots of words come to describe it. You can think of tourism, breathtaking landscapes, food, dances, history, rich mythology and various sports people and inventions. The truth is that Romania is a beautiful country which is under development. It constantly evolves, taking slow steps to become more stable. In this paper, we will discuss three important aspects which are, we can say, Romania's identity: history, culture, and innovation. First of all, Romania's history and roots are deep. Here we will talk about them, discuss them, and see Romania's development into the country that it became. We will see political changes, laws, constitutions that changed throughout the years, political regimes and so much more. Second of all, Romania's culture is rich. From mythology, to sports, and different traditions depending on the region, Romania has a rich culture which involves traditional dances, foods and the love for sport. And last, but not least, their inventions. Romanians created or contributed to inventions which changed the world. From the creation of the fountain pen to insulin, Romania created many more inventions which this paper will discuss about. As a conclusion, this paper will review what was said and*

make a short analysis, then it will discuss a bit about the future development of Romania.

Keywords: *Romania, history, culture, innovation, development, tradition*

48. (ID 444) How German Words Invaded English

Authors: stud. Ivana MANGRA, stud. Florin HALIP

Scientific Advisor: Assoc. prof. Gabriela MIHĂILĂ- LICĂ, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *The English language has always been a bit of a melting pot, constantly evolving by borrowing from different languages and cultures. One of the most interesting influences comes from German. Over the centuries, German words have quietly worked their way into English, often without us even noticing. From everyday phrases to specialized terms in fields like science, philosophy, and music, German has had a surprising impact on how we speak and write. In this project, How German Words Invaded English, we will take a closer look at how these words made their way into English, when and why they were adopted, and what kind of impact they have had. We will explore how these words have changed over time and become part of the English vocabulary in ways we might not even realize. This journey will not only show us how languages influence each other, but also help us understand the fascinating process of how English continues to grow and transform.*

Keywords: *English, German, similarities, learning difficulties, impact, influence, process, history*

49. (ID 453) The Evolution of the United Kingdom: From Empire to Modern State

Authors: stud. Mihail Ilie STROESCU GASPAROVICI, stud. Roxana Elena VASILIU

Scientific Advisor: Lecturer Diana SOPON, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *What are the first things when we hear "United Kingdom"? Some might say tea, others might say mystery, and others might say history. The truth is, the United Kingdom has it all. A kingdom with different cultures, different accents, different histories depending on the region and country. Throughout the years, the*

United Kingdom has gone through various changes: historical, political, technological. This paper aims to discuss about those important aspects which shaped the United Kingdom into what it has become today. Firstly, the historical aspect. The paper will mention a short history of the United Kingdom, about their origins and how it has evolved into what it is today. This discussed aspect will bring out the various traditions and cultural aspects of the British people as well. Secondly, we will discuss the political aspects of the country. Historical changes were mostly based on political changes. So, together with the historical changes, this paper will bring out the politics and how they changed throughout the years as well, bringing out some great figures from the British politics and what did they change in their country and even worldwide. Lastly, we will discuss technological developments. They play a big part not only in the UK, but worldwide. This paper will show and explain some of their inventions and their advantages. As a conclusion, this paper will make a short analysis of their development and where it might be in future, compared to what it is nowadays.

Keywords: *United Kingdom, history, political, technological, change, development*

50. (ID 463) The Man Who Wouldn't Die: Leadership Forged in War

Authors: stud. Andrei Emilian APOSTOL, stud. Cristian Sebastian DOGARU

Scientific Advisor: Assoc.prof. Isabela-Anda DRAGOMIR, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu

Abstract: *Sir Adrian Paul Ghislain Carton de Wiart was a British Army officer whose extraordinary resilience and battlefield presence defined a unique model of leadership. He first saw action in the Second Boer War and later served with distinction in both World Wars. Despite suffering multiple wounds (losing an eye and a hand) he repeatedly returned to command, inspiring soldiers by example rather than mere orders. A Victoria Cross recipient, Carton de Wiart exemplified a life of fearless leadership, marked by daring tactics, diplomatic service, and unwavering resilience, as vividly captured in his memoir Happy Odyssey. Carton de Wiart's legacy endures as a testament to leadership rooted in resilience, moral conviction, and*

sheer fortitude. This paper aims to explore how Carton de Wiart's life exemplifies the core principles of effective and resilient leadership through war, injury, and diplomacy. Carton de Wiart's life reminds us that true leadership is forged not just in victory, but in the courage to endure, adapt, and lead with unwavering conviction.

Keywords: *resilience, courage, frontline leadership, valor, personal example*

51. (ID 484) The Power of Belief: Placebo and Nocebo in Military Environments

Author: stud. Alecsandra Florina MAN-LUP

Scientific Advisor: Assoc. prof. Mimi-Carina COJOCARU, PhD

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *The placebo effect where belief in a treatment leads to real physiological improvement was famously observed by Dr. Henry Beecher during World War II, when wounded soldiers reported pain relief from saline injections, thinking it was morphine. Equally powerful, the nocebo effect shows how negative expectations can cause real harm, even without a physical trigger. This paper explores the neurological mechanisms behind placebo and nocebo responses and how these psychological forces impact health, performance, and decision-making. In military environments, where stress, fatigue, and suggestion run high, these effects can influence recovery, resilience, and even mission success. By understanding and applying these phenomena, military leaders and medical professionals could enhance psychological readiness, reduce medication dependency, and improve soldier outcomes. In modern warfare where the mental battlefield is as critical as the physical belief might be one of the most powerful tools at our disposal.*

Keywords: *placebo, nocebo, neurological, military, performance*

52. (ID 498) The American Dream: A Cultural Evolution Form Aspiration to Illusion

Authors: stud. Dragoș Valentin ENE, stud. Maria-Ștefania ȘEITAN

Scientific Advisor: Assist. Prof. Alina Gabriela NEGOESCU, PhD

Institution: "Nicolae Balcescu" Land Forces Academy of Sibiu; "Lucian Blaga" University of Sibiu, "Simion Barnuțiu" Faculty of Law

Abstract: *The American Dream, a long-standing cultural ideology, stands as a symbol of faith in progress and prosperity by being ambitious, initiative-driven, and hard-working despite social background. Historically rooted in the promise of equal opportunity, this paradigm has shaped personal aspirations and public policy alike. Nevertheless, considering that we are now in modern times, this term is being degenerated every day by institutional racism, socioeconomic stratification, and ineffectual public officials. Clear evidence, such as the increased violence and poverty, shows how the Dream has failed the American people and vice versa, turning this aspiration into an illusion. By analyzing data on specific topics monthly financial intake, hostile public behavior, and officials who exploit legal frameworks for personal or political gain we can clearly identify a widening gap between the American Dream and actual facts, revealing how the flawed system and beliefs have deteriorated its foundations. This paper explores, from a multidisciplinary perspective cultural, financial, and psychological how an empowering cultural ideology was twisted into an elusive and unattainable aspiration.*

Keywords: *culture, American, dream, illusion, ideology*

53. (ID 117) Psychological Preparation for Combat and Operational Stress Management

Authors: stud. Ana-Maria POSTOLACHI, stud. Alin-Ionuț ENACHE

Scientific Advisor: Associate Professor Carmen-Luminita COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Mental preparation for missions and the way we manage stress in various situations are important for those working in fields where challenges are constant. People working in demanding environments need to know how to respond quickly and effectively under pressure. This study focuses on how we can learn to handle stressful situations, stay calm, and make clear decisions when needed. It also discusses how ongoing training and emotional support can help reduce the negative effects of stress and prevent long-term issues. Another key point is the use of simulations to help individuals train in conditions similar to real-life scenarios,*

preparing them for any challenge. The main conclusion is that such preparation plays an important role in improving performance and maintaining a healthy mental balance.

Keywords: *Resilience, Stress, Training*

54. (ID 129) Firefighting- Measures & preventions

Authors: stud. Nicolae-Cristian STAN, stud. Robert-Gabriel SANDU

Scientific Advisor: Lecturer Raluca APOSTOL-MATEȘ, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *Firefighting on vessels brings particular challenges due to confined spaces, limited access to assistance from the outside, and the presence of flammable items such as oil and cargo. The maritime industry uses a combination of eco-friendly firefighting products, automated suppression technology, and sophisticated fire detection systems to prevent these hazards. Robotic systems, drones, and smart sensors are changing fire response, and safety and environmental protection are maintained by compliance to international standards like SOLAS and MARPOL. Crew ability and training are still crucial, and onboard safety is improved by frequent exercises and IMO compliance. The project examines the evolving nature of maritime firefighting, showing the importance of sustainable methods, advanced technology, and prevention in protecting people, assets, and the marine environment.*

Keywords: *Firefighting*

55. (ID 160) The Role of Artificial Intelligence in Modern Learning

Authors: stud. Denisa-Ștefania ROȘU, stud. Cătălin Ionuț BREZOI

Scientific Advisor: Lector Mariana BOERU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This article explores the various ways artificial intelligence (AI) can enhance the learning experiences of students. As AI technologies become increasingly integrated into educational environments, we as students are gaining access to powerful tools that support personalized learning, academic writing and language development. Drawing on current literature and practical examples, the article examines how AI tools can help students improve their*

academic outcomes and develop independent learning skills. The paper also considers potential challenges, including ethical concerns and overreliance on AI. By highlighting both opportunities and limitations, this study aims to provide a balanced perspective on how we as students can effectively use AI to become more autonomous and confident learners in higher education.

Keywords: *AI tools, student academic performance, learning tools and strategies*

56. (ID 186) Psychological Preparation for Combat and Operational Stress Control

Authors: stud. Alexandru - Ștefan BEREĂ, stud. Valentin ȘTEFAN HOȚU

Scientific Advisor: Associate Professor Carmen-Luminita COJOCARU, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *This presentation highlights the essential role of psychological preparation in the context of military operations, emphasizing the importance of controlling operational stress in relation to the individual and collective effectiveness of military personnel. Stress experienced during missions can directly impact reaction capability, decision-making, and team cohesion, with both immediate and long-term consequences on mental health. The paper identifies the main stressors in operational theaters and analyzes their short-term effects (intense physiological and emotional responses) and long-term consequences (adaptation disorders, anxiety, PTSD). Modern methods of psychological preparation are presented, with a focus on mental training, resilience development, and emotional self-regulation techniques, all specifically adapted to the demands of military activity.*

Keywords: *Operational stress, psychological preparation, resilience, modern methods, emotional self-regulation.*

IX. SECTION: STUDENTS' EXPERIENCES IN INTERNATIONAL EXCHANGES

Section Committee:

Chairman: Colonel Assoc. prof. Cătălin POPA, PhD

Members: CDR Marius CUCU, PhD candidate

Ens. eng. Elena ZVÂNCĂ

Stud. Ciprian MIHAI

Stud. Vlad-Remus VASILIU

Stud. Andrei-Gabriel ȚĂRUȘ

Room: "Vice-admiral Ion Coandă" Hall

1. (214) Students' Experiences in International Exchange Programs

Author: stud. Ciprian-Vasile PAUL

Scientific Advisor: Chief Police Commissioner, Prof. Bogdan ȚONEA

Institution: Police Academy "Alexandru Ioan Cuza"

Abstract: *In this presentation I want to emphasize the ups and downs of international exchanges, the many benefits that a student receives from such an experience but also the tough challenges that one has to overcome. Here I also want to talk about the impact that derives from diverse cultures, starting from language and going all the way to food, customs and schedule.*

Keywords: *Cultural diversity, challenges, personal growth, overcoming difficulties*

2. (446) The Role of Military Educational Exchanges in Public Diplomacy

Authors: stud. Rareș-Mihai IORDACHE, stud. Robert Alexandru FIRINCĂ

Scientific Advisor: Major Associate Professor Gabriela NICOARĂ

Institution: National Defense University Carol I

Abstract: *In the 21st century, military education and research are undergoing significant transformations, driven by deeper*

partnerships between collective security structures and the democratic frameworks of states. These changes reflect a shift toward integrated defense strategies and a multidimensional approach to global security. This study explores how international military exchange programs influence the values, operational practices, and strategic outlooks of armed forces worldwide. The objective is to assess their impact on international cooperation and long-term soft power development. The methodology is based on case studies of existing exchange programs, analyzing their structure, goals, and outcomes. Military exchanges strengthen interoperability and foster lasting personal and professional relationships that act as informal communication channels. These programs promote mutual understanding through immersion in different cultural and institutional environments. They aim to enhance collaboration with foreign armed forces, support coalition readiness, and introduce participants to diverse worldviews. By advancing highly skilled individuals who represent national values abroad, these exchanges align with the concept of "smart power," promoting national interests through diplomacy and cooperation. The study positions these programs within a public diplomacy framework and proposes an improved candidate selection approach to better meet strategic objectives. A two-step communication model explains the long-term influence of these programs. First, military institutions socialize participants typically officers into shared values and operational standards. Second, these individuals return home as knowledge brokers and change agents, bringing new ideas and fostering innovation. Over time, such interactions contribute to shaping the ethos and worldview of military communities, reinforcing global military soft power. In conclusion, this study highlights the importance of military exchange programs as instruments of soft power, cultural diplomacy, and operational synergy. The findings demonstrate that such programs not only improve interoperability and professional development but also contribute to building resilient international networks. As global security challenges grow more complex, investing in and refining military educational exchanges becomes essential for fostering long-term cooperation and mutual trust among allies.

Keywords: *Military exchange programs soft power Interoperability International cooperation public diplomacy*

3. (470) From Uniformity to Unity: Piecing Together an International Mindset

Author: stud. Laurențiu-Andrei BUZGURILĂ

Institution: "Alexandru Ioan Cuza" Police Academy

Abstract: *Nowadays, we live in a world where intercultural connection and collaboration are becoming increasingly important: not only for understanding how a country is structured and functions, but also for identifying the gaps and challenges that may be holding it back from greater progress and prosperity, especially when seen in comparison with other nations. This project will show the importance of cross-cultural interaction by focusing on my one-week international experience with students from a variety of backgrounds, including those from the Land of the Rising Sun: China, developed Western countries, and our neighboring countries. Interacting with students from across the globe taught me and might help others to understand that being open-minded, curious, and stepping boldly into the unfamiliar are essential steps of developing a global perspective. Beyond academics, it is the personal interactions the spontaneous conversations, shared meals, and cultural surprises that truly enrich someone's appreciation of diversity, highlighting how even a short journey abroad can leave a profound and lasting impact. We'll explore how these programs help students grow more confident, more curious, more open to the world.*

Keywords: *Intercultural connection, Global perspective, Student exchange, Cultural diversity, Personal growth*

4. (477) Students Abroad: Challenges, Expectations, and Transformative Outcomes

Author: stud. Marian-Valentin-David BARZU

Scientific Advisor: Chief Police Commissioner, Prof. Bogdan ȚONEA, PhD

Institution: Police Academy "Alexandru Ioan Cuza"

Abstract: *In the context of internationalization, we encounter many favorable aspects. The freedom of movement we enjoy also extends to the academic environment, much to the delight of students who*

benefit from the Erasmus+ program. Within these programs, personal growth, overcoming linguistic and cultural barriers, and self-development become possible. I want to discuss the difficulties, risks, and benefits of these activities.

Keywords: *Erasmus+, Experiences*

5. (165) The Ship's Crew as a Multicultural Work Team. Work Culture, Cultural Distance, Attitudes, Values, And Prejudices

Author: stud. Alba-Smaranda Chiriac

Scientific Advisor: Associate Professor Carmen Cojocaru, PhD

Institution: “Mircea cel Bătrân” Naval Academy, Constanta

Abstract: *The presentation analyzes the ship's crew as a multicultural work team, emphasizing the importance of collaboration in a demanding and dangerous environment. The diversity of nationalities and cultures requires understanding differences in attitudes, values, and communication styles. Cultural distance, stereotypes, and prejudices can affect team cohesion and work efficiency. Therefore, leaders must promote intercultural communication, mutual respect, and ongoing training. I also shared a personal experience from the WAT USA program, where I interacted with people from diverse backgrounds, learning to manage differences through empathy and adaptability. Although prejudices are inevitable, they can be overcome through respect, openness, and responsible leadership.*

Keywords: *multicultural stereotypes prejudices leader communication training learning leadership*