



UNIVERSITY OF MONTENEGRO  
*Faculty of Maritime Studies Kotor*



2<sup>nd</sup> Kotor International Maritime Conference  
November 27–30, 2022 | Kotor, Montenegro

# Book of Abstracts



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## **BOOK OF ABSTRACTS**

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### **EDITOR IN CHIEF:**

Špiro Ivošević

### **ASSISTANT EDITORS:**

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Tatijana Dlabač

Zorica Đurović

Maja Škurić

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### **TECHNICAL ASSISTANTS:**

Ana Babović

Vera Kapetanović

## *A Word from the Dean*

Dear colleagues and researchers,

It is my immense pleasure to introduce the celebration of the 63<sup>rd</sup> anniversary of the Faculty of Maritime Studies Kotor and the 2<sup>nd</sup> Kotor International Maritime Conference (KIMC 2022). Last year proved that we successfully overcame scientific and research challenges associated with the Covid-19 pandemic. Leaving this period behind, we ambitiously proceed with the education process, together with our students, in the classroom. The Faculty has expanded its scientific and research work, particularly in the domain of projects related to the blue growth and marine heritage surveillance and protection, dual education in the maritime sector, promotion of nautical tourism and fostering international cooperation among maritime institutions in the Adriatic and Ionian region regarding the implementation of joint uniform governance policies.

We have welcomed a significant number of Erasmus students and teachers from all around the world. I am proud that we enlarged the number of the teaching bases and, what is more, established new friendships with reputable professionals from maritime universities, maritime economy and national and international shipping companies.

Sailing towards ambitious ideas and projects, we continued with the research in the field of maritime sciences by establishing the Faculty's scientific journal in May 2022 titled "Časopis Pomorskog fakulteta Kotor - *Journal of the Maritime Sciences*", with the second number in progress. Our Editorial Board gathers distinguished professors who assist us in selecting high-quality articles on maritime affairs.

I am very proud that this year the Conference will give our undergraduate and master students an opportunity to present their papers at the KIMC 2022 Conference. Led by the idea that young students, future researchers, should be involved in scientific research during their studies, this year, the Editorial Board decided to leave them space to express their ideas, under the mentorship of their teachers, within the *Student Session*.

Lastly, I am sure that you will enjoy reading the KIMC 2022 *Book of Abstracts* which presents, in my modest opinion, actual and very innovative discussions on numerous topics in navigation, marine engineering, energy efficiency in maritime sector, marine automation and electronics, information technologies in shipping, marine ecology and blue growth, maritime management and logistics, transportation, seafarers' health, maritime law, communications, education, and applied mathematics and programming in maritime sciences.

Regards,

*Assoc. Prof. Špiro Ivošević*

*Dean of the Faculty of Maritime Studies Kotor*



# KIMO 2022

## Contents

ADDITIVE MANUFACTURING AND ENERGY EFFICIENCY .....	1
Maja Krčum, Bruna Bacalja, Anita Gudelj .....	1
AN ERA OF NEW LEARNING ENVIRONMENTS FOR STCW COURSES.....	2
Tanja Brcko, Violeta Jurkovič, Andrej Androjna.....	2
ANALYSIS OF COMMUNICATION PROCEDURES FOR MEDICAL URGENCIES ON BOARD .....	3
Franko Žunić, Rosanda Mulić, Dean Sumić .....	3
ANALYSIS OF NAVIGATION ACCIDENTS RELATED TO THE OVER-RELIANCE ON ECDIS .....	4
Lea Vojković, Filip Bojić, Srđan Vujičić, Rino Bošnjak.....	4
ANALYSIS OF THE HYDROACOUSTIC SIGNATURE RESULTS OF METAL AND ISOTROPIC PROPELLERS WORKING IN BOLLARD PULL MODE IN A TOWING TANK.....	5
Piotr Szymak.....	5
ANALYSIS OF THE REGULATORY FRAMEWORK IN THE CROATIAN MARICULTURE SECTOR.....	6
Manuela Vukić, Tena Bujas, Marija Koričan, Zdenko Tonković, Nikola Vladimir .....	6
APPLICATION OF VIBRATION RESONANCE PARAMETERS IN DIAGNOSTICS OF TURBINE ENGINES ROTOR SYSTEMS .....	7
Marcin Kluczyk, Andrzej Grzędziela .....	7
CAUSES OF WEAR ON PISTON RINGS AND CYLINDER LINERS - “ISHIKAWA DIAGRAM” .....	8
Miroslav Vukičević, Nikola Račić, Boris Hrnčić.....	8
CHALLENGES FOR SEAFARERS TRAINING IN THE CONTEXT OF AUTONOMOUS SHIPS DEVELOPMENT.	9
Toni Meštrović, Ivica Pavić, Andrej Androjna, Mislav Maljković .....	9
COMPARISON OF MAINTENANCE COST FOR LNG FUELED SHIPS.....	10
Kamil Özden Efes.....	10
CONTRIBUTION OF PROJECT RESPOND-A TO EFFICIENT MARITIME RESCUE AND SAFETY RESPONSE USING COMBINED NEXT-GENERATION TECHNOLOGIES APPROACH .....	11
Zdravko Paladin, Nexhat Kapidani .....	11
CORROSION PREDICTION OF FUEL TANKS ON BULK CARRIER.....	12
Jakša Vujović, Vesna Popović-Bugarin, Špiro Ivošević .....	12
COST-BENEFIT MODEL OF NATIONAL MARITIME SINGLE WINDOW IN MONTENEGRO .....	13
Nexhat Kapidani, Enis Kočan, Edvard Tijan .....	13

CURRENT INFECTION RISKS AND PREVENTATIVE MEASURES ON BOARD SHIPS .....	14
Rosanda Mulić, Ivana Vidan .....	14
CYBERSECURITY IN THE MARITIME SECTOR: ISSUES, CHALLENGES AND LEARNED LESSONS .....	15
Anita Gudelj, Maja Krčum, Roko Sikimić .....	15
DEEP LEARNING APPROACHES FOR MONITORING OF SHIP PROPULSION SYSTEM .....	16
Ivana Čavor, Jovan Šušić .....	16
DIGITIZED UNDERWATER MARITIME CULTURAL HERITAGE FOSTERING THE BLUE GROWTH INITIATIVES, WRECK\$4ALL CASE STUDY .....	17
Darko Kovačević .....	17
EARLY-STAGE ELECTRIFICATION CONCEPT OF A FERRY FOR THE BAY OF KOTOR .....	18
Milan Kalajdžić, Nikola Momčilović, Luka Mijatović .....	18
ELECTRONIC REGISTER MODEL FOR ARCHIVING MARITIME DOCUMENTATION .....	19
Nataša Gojgić, Vesna Ružičić, Marija Nikolić .....	19
E-NAVIGATION WITHIN BOKA BAY: E-ATON IMPLEMENTATION FOR THE PURPOSE OF NON-SOLAS CRAFTS .....	20
Ivan Mraković, Rino Bošnjak .....	20
ENERGY CONSUMPTION ANALYSIS OF THE OIL TANKER DURING CARGO OPERATIONS: A CASE STUDY BASED ON OPERATOR ERROR .....	21
Ali Cem Kuzu .....	21
EVALUATION OF APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE MARITIME INDUSTRY .....	22
Lemana Spahić Bećirović, Ammar Trakić, Sarah Ganović, Lejla Gurbeta Pokvić, Dušanka Bošković .....	22
EVALUATION OF DIESEL QUALITY MARKET IN ALBANIA .....	23
Milidin Bakalli, Julis Selamaj, Osman Metalla .....	23
EXAMPLES OF STATISTICAL ANALYSIS IN CRUISE SHIPPING .....	24
Marina Zanne .....	24
EXECUTION OF A SHIP DEPARTURE MANOEUVRE USING FULL MISSION BRIDGE SIMULATOR AND EVALUATION OF THE PROPELLER VELOCITY FIELD WITH MIKE 3 FM .....	25
Marko Perković, Aleksander Grm, Peter Vidmar .....	25
FISHERIES ECONOMICS IN ALBANIA .....	26
Llambi Prendi, Brunela Trebicka, Klarida Prendi .....	26
FORMATION OF COMMUNICATION STRATEGY AT THE STRATEGIC LEVEL IN MARITIME COMPANIES .....	27
Pavle Popović, Draško Kovač, Božidar Vukšić .....	27
HOW TO IMPROVE MONTENEGRIN SEAFARER COMPETITIVENESS IN THE INTERNATIONAL MARKET .....	28
Miroslav Vukičević, Igor Petrović, Zorica Đurović, Lazar Dragović .....	28
IMPACTS OF BLOCKCHAINS AND SHARING ECONOMY ON INLAND WATERWAY TRANSPORT COSTS .....	29
Anita Abodji, Marijana Petrović, Vladislav Maraš, Danijela Pjevčević, Aleksandar Radonjić .....	29

IMPLEMENTATION OF MODERN TECHNOLOGIES IN COASTAL NAVIGATION .....	30
Igor Petrovic, Pero Vidan .....	30
IMPRESSED CURRENT CATHODIC PROTECTION .....	31
Lazar Mrdović, Đorđe Nedeljkov, Ilija Knežević.....	31
INNOVATIVE SYSTEMS TO ENHANCE ANTIFRAUD CUSTOMS CONTROLS IN ITALIAN, ALBANIAN, AND MONTENEGRIN SEAPORTS.....	32
Radmila Gagić, Senka Šekularac-Ivošević, Maja Škurić, Danilo Nikolić .....	32
INTERNATIONAL LEGAL FRAMEWORK FOR AUTONOMOUS VESSELS – RECENT DEVELOPMENTS .....	33
Igor Vio.....	33
INVESTIGATING THE INFLUENCE OF REGULATORY STANDARDS IN MARITIME TRANSPORT ON THE SAFETY OF SHIPS .....	34
Darijo Mišković.....	34
KEY PERFORMANCE INDICATORS OF THE QUALITY MANAGEMENT SYSTEM IN THE FUNCTION OF MONITORING THE EDUCATION AND TRAINING OF SEAMEN AT THE FACULTY OF MARITIME STUDIES KOTOR .....	35
Vera Kapetanović, Igor Stanovčić, Miroslav Vukičević, Igor Petrović, Tatijana Dlabač .....	35
LEGAL REGULATIONS OF LABOR RIGHTS OF CROATIAN SEAFARERS.....	36
Marija Pijaca, Božena Bulum.....	36
LITERATURE REVIEW ON THE APPLICATION OF BLOCKCHAIN TECHNOLOGY IN MARITIME SUPPLY CHAIN SYSTEMS .....	37
Tatjana Davidović, Ana Nives Radović, Miodrag Mihaljević, Milan Todorović, Slobodan Jelić .....	37
MARKETING EFFECTS OF SOCIAL MEDIA ACTIVITIES IN SHIPPING: A COMPARATIVE ANALYSIS OF CONTAINER AND MULTIPURPOSE OPERATORS.....	38
Senka Šekularac-Ivošević, Đorđe Lakonić, Boban Melović, Dragana Milošević, Veldin Ovčina .....	38
MARKETING IN PORT ACTIVITIES SUPPORTED BY ARTIFICIAL NEURAL NETWORKS .....	39
Anja Stijepović, Kruna Ratković, Nataša Kovač .....	39
MARKETING SOURCES OF INFORMATION WHEN CHOOSING MONTENEGRO AS A NAUTICAL DESTINATION .....	40
Senka Šekularac-Ivošević, Zoran Kovačević, Tanja Poletan-Jugović, Ilija Moric, Sanja Peković .....	40
MODERN PREVENTIVE METHODS OF VIBRATION DIAGNOSTICS IN THE MAINTENANCE OF SHIP DRIVES AND MACHINES.....	41
Davorka Šaravanja, Marinko Aleksić.....	41
NEW CHALLENGES IN THE MOTORWAYS OF THE SEA CONCEPT WITHIN THE SOUTH ADRIATIC-IONIAN REGION.....	42
Maja Škurić, Radmila Gagić, Danilo Nikolić.....	42
OCEAN LITERACY AND THE ROLE OF PREVENTIVE MEASURES IN SUSTAINABLE SHIPPING .....	43
Merica Slišković.....	43



ORGANIZATIONAL DESIGN AND RECRUITMENT PROCESS IN A START-UP PHASE OF A YACHTING COMPANY DEVELOPMENT.....	44
Ljiljana Premović.....	44
OVERVIEW OF THE DEVELOPMENT OF NAUTICAL CHARTS.....	45
Jakša Mišković, Ivica Pavić, Pero Vidan, Srđan Vukša.....	45
PERFORMANCE OF CRUISE PORTS.....	46
Elen Twrdy, Vivien Lorenčič.....	46
PORT MACHINERY PREDICTIVE MAINTENANCE: SELECTING “HIGH – CRITICAL” PORT MACHINERY ..	47
Deda Đelović.....	47
POSSIBILITIES OF APPLICATION OF TENSOMETRIC MEASUREMENTS IN DIAGNOSTIC AND VSR METHODS FOR STRESS REDUCTION AFTER WELDING ELEMENTS OF SHIP LOAD CARRYING SUBSECTIONS.....	48
Fuad Hadžikadunić.....	48
PRELIMINARY DATA OF SEAWATER QUALITY: EVIDENCE FROM VOLLGA’S BEACH IN DURRES, ALBANIA.....	49
Stela Sefa, Osman Metalla, Eduart Ndokaj.....	49
RISK CRITERIA IN OIL TANKER TRADE .....	50
Peter Vidmar.....	50
SEA VESSEL WASTEWATER RISK ASSESSMENT AT BOKA BAY AND THE PORT OF KOTOR.....	51
Pavić Bracanović, Žarko Koboević, Špiro Ivošević.....	51
SELECTION OF PROPELLERS AND PROPULSION MOTORS AS A FUNCTION OF IMPROVING THE OVERALL PROPULSION COEFFICIENT.....	52
Jovan Šušić, Jovo Dautović, Radoslav Tomović.....	52
SHIPPING SERVICES IN THE FUNCTION OF SUSTAINABLE DEVELOPMENT .....	53
Suzana Šamija, Maja Krčum, Ines Kolanović.....	53
SOME ASPECTS OF THE PROBLEM OF DUMPED ORDNANCE AND EXPLOSIVE REMNANTS OF WAR IN THE MONTENEGRIN UNDERSEA .....	54
Marinko Aleksić, Sead Cvrk, Dražen Božović.....	54
STRATEGIES TO ENHANCE STUDENT ENGAGEMENT IN E-LEARNING BY USING THE COMMUNITY OF INQUIRY (COI) FRAMEWORK IN ESP INSTRUCTION .....	55
Lena Tica, Ivana Krsmanović.....	55
STRUCTURAL FUEL TANK RELIABILITY ANALYSIS USING THE EXAMPLE OF BULK CARGO VESSELS.....	56
Matija Rašković, Špiro Ivošević.....	56
TANK-LEVEL CONTROL FOR COUPLED TANK USING PID CONTROLLER .....	57
Sanja Antić, Tatijana Dlabač, Martin Čalasan, Alenka Milovanović, Nikola Marvučić.....	57
THE ANALYSIS AND DESIGN OF A SOLAR PV SYSTEM FOR TOURIST SHIPS .....	58
Ilija Knežević, Snežana Dragičević, Draško Kovač, Tatijana Dlabač.....	58

THE APPLICATION OF BLOCKCHAIN TECHNOLOGY IN MARITIME LOGISTICS TO INCREASE TRACEABILITY .....	59
Ana Nives Radović.....	59
THE APPROACH TO MARINE LITTER ISSUE IN LINE WITH CIRCULAR ECONOMY .....	60
Lidija Runko Luttenberger, Ivica Ančić, Axel Luttenberger .....	60
THE BLUE ECONOMY AND CLIMATE ADAPTATION: TOURISM AND MARITIME MANAGEMENT CHALLENGES IN MONTENEGRO.....	61
Milica Katnić, Ilija Moric.....	61
THE COMPARATIVE ANALYSIS OF MARITIME LEGISLATION IN THE GREEK AND MONTENEGRIN LEGAL SYSTEM.....	62
Jelena Nikčević, Victoria Athanassopoulou .....	62
THE DEVELOPMENT OF A POTENTIAL STUDY PROGRAMME OF MARITIME STUDIES BASED ON THE DUAL MODEL OF HIGHER EDUCATION IN MONTENEGRO .....	63
Darko Petković, Špiro Ivošević .....	63
THE EFFECT OF TRIM ON THE TOTAL RESISTANCE OF A CONTAINER SHIP .....	64
Ivana Martić, Nastia Degiuli, Katarina Martić, Andrea Farkas, Carlo Giorgio Grlj.....	64
THE INFLUENCE OF SHALLOW WATERS ON THE MANEUVERING OF LARGE SHIPS .....	65
Mislav Maljković, Ivica Pavić, Marko Perković, Toni Meštrović.....	65
THE LEGAL REGIME FOR BERTHING CONTRACTS ACCORDING TO CROATIAN MARITIME CODE .....	66
Adriana Vincenca Padovan, Vesna Skorupan Wolff.....	66
THE ROLE AND POTENTIALS OF VESSEL TRAFFIC SERVICES (VTS) IN THE CONTEXT OF E-NAVIGATION .....	67
Igor Stanovčić, Rino Bošnjak, Božo Krstajić .....	67
THE USE OF MARITIME INCIDENTS REPORTS IN TEACHING THE IMO STANDARD MARINE COMMUNICATION PHRASES.....	68
Milena Dževerdanović-Pejović, Zorica Đurović.....	68
UNDERSTANDING OF TERMS AND EFFECTIVE COMMUNICATION IN BRIDGE TEAM MANAGEMENT .	69
Igor Petrović, Milena Dževerdanović-Pejović, Dejan Milinić .....	69
VALIDATION OF CHANGES IN THE COST BEHAVIOR OF DIFFERENT TRANSPORT MODES DURING THE CRISIS .....	70
Luka Vukić, Roko Glavinović, Ivan Peronja.....	70
VIBRATION MEASUREMENT PROCEDURES FOR MONITORING PROPELLER MODIFICATIONS IMPACT ON SHIP PROPULSION CHARACTERISTICS.....	71
Josip Orović, Marko Valčić, Josip Mijatov, Jelena Čulin .....	71
Student Session.....	73
CONCEPTUAL FRAMEWORK FOR STRENGTHENING THE BRAND THROUGH DIGITAL MARKETING ON THE EXAMPLE OF MARINAS IN MONTENEGRO .....	75
Marija Stevanović.....	75

COMMUNICATIVE ASPECTS OF WRITING A HIGH-QUALITY SEAMAN RESUME .....	76
Kristina Radnjić.....	76
THE USE OF COLLOCATIONS IN THE IMO STANDARD MARINE COMMUNICATION PHRASES.....	77
Miloš Živović, Petar Mustur, Bogdan Gačić .....	77
USE OF SOLAR ENERGY AS AN ALTERNATIVE SOURCE OF ELECTRICAL POWER PRODUCTION ON SHIPS .....	78
Nemanja Pudar, Lazar Mrdović, Jakša Medojević.....	78
AUTONOMOUS SURFACE VESSELS (ASV) AND THEIR POTENTIAL IN DIFFERENT SURVEY APPLICATIONS .....	79
Lazar Mrdović, Nemanja Pudar, Jakša Medojević.....	79
ADVANTAGES AND DISADVANTAGES OF MARINA BAR IN THE CONTEXT OF FUTURE MARKET CHALLENGES .....	80
Pavle Nedeljkov.....	80
STATIC ELECTRICITY ON BOARD THE SHIPS SUBJECT TO IGF CODE - HAZARDS AND PREVENTION .....	81
Stefan Leovac, Martin Žurić, Luka Lučić.....	81
MARINA BUSINESS MARKET RESEARCH .....	82
Teodora Pantović .....	82
SHIPPING MARKET RESEARCH - CONTAINER MARKET .....	83
Ivana Baćović.....	83
INSTITUTIONAL AND LEGAL FRAMEWORK OF MONTENEGRO FOR THE PROTECTION OF THE SEA FROM POLLUTION FROM VESSELS.....	84
Jasminka Luković Jagličić.....	84
THE DEVELOPMENT OF THE NAVIGATION SAFETY SYSTEM AS A FACTOR IN THE DEVELOPMENT OF NAUTICAL TOURISM IN MONTENEGRO.....	85
Jasminka Luković Jagličić.....	85
PREVENTION OF SEA POLLUTION BY BALLAST WATER - LEGAL FRAMEWORK.....	86
Dino Jonuz.....	86
ORGANIZATION OF STAFF TRAINING IN THE FIELD OF NAUTICAL TOURISM IN MONTENEGRO .....	87
Dino Jonuz, Milan Radan.....	87
E-HEALTH: AN INNOVATIVE PRODUCT IN NAUTICAL TOURISM .....	88
Dino Jonuz, Božo Nikčević, Jasminka Luković Jagličić, Milan Radan.....	88
ORGANIZATION OF THE REGATTA WITH THE FUNCTION OF IMPROVING NAUTICAL TOURIST OFFERS IN MONTENEGRO.....	89
Snežana Hudiček .....	89
THE IMPORTANCE OF TRAINING FOR OFFICERS AND CREW SERVING ON SHIPS SUBJECT TO IGF CODE .....	90
Nikola Jelić, Luka Mijušković .....	90

DATA PROTECTION IN PORTS USING ARTIFICIAL INTELLIGENCE METHODS .....	91
Una Sredović .....	91
PERFORMANCE OF THE ELECTRICITY PRODUCTION ON THE ENGINE ROOM SIMULATOR .....	92
Nemanja Tabaš, Ana Simeunović, Blagoje Mičeta, Vasilije Kovačević .....	92
Index of Authors.....	94
Student Session – Index of Authors and Supervisors .....	96
Organizing Committee.....	98
Programme Committee .....	99
Časopis Pomorskog fakulteta Kotor – <i>Journal of Maritime Sciences</i> .....	100
Aquarium BOKA .....	102
Ongoing Projects .....	103
Alumni Association.....	104
Organizer, Co-organizer & Sponsors .....	105

# EARLY-STAGE ELECTRIFICATION CONCEPT OF A FERRY FOR THE BAY OF KOTOR

Milan Kalajdžić<sup>1</sup>, Nikola Momčilović<sup>2</sup>, Luka Mijatović<sup>3</sup>

1 University of Belgrade, Faculty of Mechanical Engineering, Department of Naval Architecture, Serbia, mdkalajdzic@mas.bg.ac.rs

2 University of Belgrade, Faculty of Mechanical Engineering, Department of Naval Architecture, Serbia, nmomcilovic@mas.bg.ac.rs

3 University of Belgrade, Faculty of Mechanical Engineering, Department of Naval Architecture, Serbia, luka.mijatovic14@yahoo.com

## Abstract

In order to address the environmental concerns and reduce the air pollution from traditional diesel engines, maritime authorities have been gradually introducing the energy efficiency requirements for ships. Mostly, the shipping sector response consists of measures such as power reduction, application of various energy saving devices and alternative fuels. The latter presents the radical and an efficient way to almost completely reduce onboard emissions, by installing the propulsion systems powered by batteries (electric drive), hydrogen, ammonia, or other “carbon-free” sources of energy. Therefore, this paper presents an early-stage design of the electrification concept of the ferry regularly navigating in the Bay of Kotor between the ports of Kamenari and Lepetani. Such short-routed operation can be practical for the application of electric drive with batteries, as a sole source of power. Preliminary design methodology for the calculation of the ship’s operational profile is presented, along with the electrification concept for the ferry on the specific route. Findings showed that the proposed design can be viable for the small-scale Ro-Ro navigation in the Bay of Kotor aquatorium, especially given the UNESCO World Heritage site status of the area.

**Keywords:** *electric ferry, decarbonization, energy efficiency, Bay of Kotor, Bay of Kotor decarbonization*