

EMRA 2023

19.-21.6. - Šibenik

Interreg
ADRION ADRIATIC-IONIAN
European Regional Development Fund - Instrument for Pre-Accession II Fund



EUROPEAN UNION

MARBLE



AGENDA

JUNE 19

18:30 - 19:30

WELCOME RECEPTION

BARONE FORTRESS, PUT VUKA MANDUŠIĆA,
22000, ŠIBENIK

JUNE 20

08:30 - 09:00

REGISTRATION/MEET & GREET

09:00 - 09:15

OPENING SESSION

Assist. Professor Fausto Ferreira, General Chair

09:15 - 09:45

INDUSTRY KEYNOTE

Lürssen, Ana Odak, GITONE Kvarner

09:45 - 10:30

EU PROJECT PRESENTATIONS

RAMONES, Dr. David Cabecinhas, Instituto Superior Técnico
RESURGAM, Dr. Edin Omerdic, University of Limerick
DeeperSense, Nimish Shah, DFKI

10:30 - 11:00

COFFEE-BREAK

11:00 - 12:00

EU PROJECT PRESENTATIONS

MAELSTROM, Dr. Massimo Caccia, CNR-INM
ecobotics.sea, Prof. Jorge Dias, University of Coimbra
SeaClear, Assoc. Prof. Ivana Palunko, University of Dubrovnik
NetTag+, Prof. Alfredo Martins, INESC-TEC

12:00 - 13:30

LUNCH BREAK

13:30 - 14:00

INDUSTRY KEYNOTE

SAIPEM, Marco Novello, SAIPEM

14:00 - 14:30

WIDERA EU PROJECTS

Intro to WIDERA program, Adeline Kroll, EC DG R&D
UWIN-LABUST, Prof. Nikola Mišković, FER, University of
Zagreb

14:30 - 14:45

COFFEE-BREAK

14:45 - 15:45

WIDERA EU PROJECTS

BCThubs, Polyvios Raxis, ATLANTIS
INNO2MARE, Damir Opsenica, Maritime Center of
Excellence
MONUSEN, Prof. Igor Radusinovic, University of Montenegro
SeaTechHub, Dr. Ioannis Kyriakides , CMMI

15:45 - 16:45

DISCUSSION ON WIDENNING PROJECTS

Roundtable on WIDERA projects challenges moderated by
Adeline Kroll, EC DG R&D

16:45 - 17:00

WRAP-UP OF THE DAY

Wrap-up of the day, Assist. Prof. Fausto Ferreira, General
Chair

19:30 - 20:30

GALA DINNER

Location: Dalmatian Ethno Village, Amadria Park, Hoteli
Solaris 86, 22000 Šibenik

JUNE 21

08:30 - 08:45

MEET & GREET

08:45 - 09:15

INDUSTRY KEYNOTE

IN2, Josip Madunić

09:15 - 10:15

EU PROJECT PRESENTATIONS

PASSPORT, Prof. Alessandro Ridolfi, University of Florence
INNOVAMARE, Mateo Ivanac, Croatian Chamber of
Economy
MARBLE, Prof. Nikola Mišković, FER, University of Zagreb
ILIAD, Dr. Antonio Vasilijević, Norwegian University of
Science and Technology

10:15 - 10:45

COFFEE-BREAK

10:45 - 11:15

INDUSTRIAL TALKS

Geoimaging, Dr. Elena Valari,
oceandrone, Stefano Malagodi

11:15 - 12:00

**ROUNDTABLE ON CHALLENGES AND
OPPORTUNITIES IN SUSTAINABLE BLUE
ECONOMY GROWTH**

Adeline Kroll, DG R&D, Mislav Kovač, Croatian Ministry of
Regional Development and EU funds, Mateo Ante Bosnić,
Ministry of Science and Education, moderated by Carlo
Kraskovic, mareFVG

12:00 - 12:15

CLOSING CEREMONY

Representative of the Ministry of Regional Development
and EU funds

12:15 - 13:30

LUNCH



ORGANIZING COMMITTEE

- Nikola Mišković,
University of Zagreb, Croatia
- Roe Diamant,
University of Haifa, Israel
- Fausto Ferreira - General Chair,
University of Zagreb, Croatia
- Igor Radusinovic,
University of Montenegro, Montenegro
- Mateo Ivanac,
Croatian Chamber of Economy, Croatia
- Ioannis Kyriakides,
University of Nicosia, Cyprus
- Matija Bumbak,
DIH Agrifood Croatia, Croatia
- Ivana Bujas Rupić,
DIH Agrifood Croatia, Croatia
- Krešimir Ivić,
DIH Agrifood Croatia, Croatia

ABSTRACT MARINN

Building a Sustainable Maritime Industry through Innovation and Collaboration Lürssen Group is a world leader in building of luxury yachts and vessels for naval defence. The talk will focus on presenting the Lürssen Group efforts in innovations which lead to the creation of Maritime Innovation Cluster – MARINN, as well as the reasons for forming the cluster. The speech will cover the five pillars of the MARINN cluster: autonomous vessels, smart and green marinas, green technologies, clean propulsion and skills development. The talk will also highlight the activities of the cluster, which are intended to identify and prepare strategic projects and foster cooperation between industry and academia. The main areas of focus within the cluster are autonomy, safety, navigation systems, digital technologies, waste management and clean energy. In addition, during the talk, we will also present the development of a new marina Porto Baroš that will be the first green and smart marina in the Adriatic. We will showcase how this marina, located in Rijeka, is integrating digital and green technologies to create a smart and eco-friendly environment.

BIOGRAPHY OF LÜRSEN GROUP AND GITONE KVARNER



Lürssen Group is a world leader in the field of shipbuilding and nautical, with an emphasis on the construction of luxury yachts, as well as military vessels of general and special purpose. The group was founded by Friedrich Lürssen in 1875 in Bremen, Federal Republic of Germany and has been operating under the Lürssen family ever since. Today, the company is lead by brothers Peter and Friedrich Lürssen, and it consists of several companies, such as Fr. Lürssen Werft GmbH & Co. KG, Lürssen Logistics, Lürssen Yachts, Lürssen Schacht-Audorf, and Lürssen Berne-Bardenfleth. The group operates through a total of eight shipyards at three locations - Bremen, Hamburg and Rendsburg with more than 2.800 employees. In its history of over 140 years, the group has so far built over 13,000.00 vessels. In order to continue and ensure the long-term survival, the group decided to expand its portfolio of activities in Croatia so they founded the company GITONE Kvarner d.o.o. which serves as a main company for investment management in Croatia. Gitone Kvarner d.o.o. has exceptional know-how potentials, strong management capacities that ensure the highest standards of investment and implementation and stable sources of financing, all with the aim of implementing various development initiatives that will strongly position the company on the Croatian and European markets.

ABSTRACT RAMONES

RAMONES



Natural radioactivity in the marine environment has been present since the Earth's formation, while artificial radionuclides were introduced into the oceans in 1944. More recent direct sources exist that feed the oceans, such as low-level liquid discharges from reprocessing plants, large-scale releases due to disasters (e.g. Fukushima hit by the tsunami in 2011), and smaller-scale radiological events. Exploration of submarine environments should consider the existence of radioactivity in terms of its short- and long-term impact on marine and coastal ecosystems, also in correlation to natural hazards, such as seismic activity over submarine faults. Significantly undersampled in oceans, radioactivity poses real risks to marine ecosystems and human population, urging for detailed, data-driven modelling. RAMONES aims to offer new and efficient solutions for in situ, continuous, long-term monitoring of radioactivity in harsh subsea environments. A new generation of submarine radiation-sensing instruments, assisted by SoA robotic and artificial intelligence (AI) will be developed towards understanding radiation related risks near and far from coastal areas, while providing data towards shaping new policies and guidelines for environmental sustainability, economic growth and human health. The main ambition is to lay a radical new path to close the existing marine radioactivity under-sampling gap

and foster new interdisciplinary research in threatened natural deep-sea ecosystems. RAMONES will invest a significant effort to provide tools for long-term, rapid deployments, propose new AI-driven and supported methodologies, and offer scaled-up solutions to researchers, policy makers and communities. RAMONES will combine SoA equipment from various disciplines and advanced modeling in fine synergy, and design new and effective approaches for the marine environment to provide efficient response to natural and man-made hazards, shaping future policies for the global population.

BIOGRAPHY DAVID CABECINHAS

David Cabecinhas received the Licenciatura and Ph.D. degrees in electrical and computer engineering from the Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal, in 2006 and 2014, respectively. He is currently a Researcher with the Laboratory for Robotics and Engineering Systems, Institute for Systems and Robotics, Lisbon. His current research interests include nonlinear control, sensor-based and vision-based control, modeling and identification, and fault detection and mitigation with applications to autonomous aerial, surface, and underwater robotic vehicles

ABSTRACT RESURGAM

RESURGAM project aims a decisive break-through with Friction Stir Welding (FSW) as a high integrity, low distortion, environmentally benign, welding technique to be developed in steel, in air, to facilitate the modular construction of ships across multiple yards with final assembly at one master yard and the development of the process of underwater, robotic FSW to allow repairs to be carried out on marine structures without needing to bring ships or platforms ashore to a dry dock. These fabrication and repair capabilities, backed by the secure, digital Industry 4.0 infrastructure and techniques already in widespread use in the automotive and aerospace industries, will facilitate the rapid, coordinated but distributed modular manufacture of ships and watercraft throughout Europe. Practically, this will allow ships damaged anywhere in the world will have the option of being repaired in place without the need to travel to the nearest dry dock. All of this will be implemented by the European shipyards and Naval architects in Europe.

BIOGRAPHY – EDIN OMERDIC

Edin is a Senior Research Fellow in the MMRRC at the University of Limerick. His research interests include modeling & simulation of dynamic systems (marine platforms, ocean dynamics & disturbances), renewable energy, real-time simulators, virtual reality, development and design of guidance, navigation and control system for marine vessels, nonlinear control systems, implementation of soft-computing techniques in intelligent systems, underwater robotics, fault-tolerant systems.

He is engaged in numerous research projects funded by the Higher Education Authority and the Marine Institute in the area of submersible robotics. He is also the main developer & designer of OceanRINGS concept & software suite, including design of state-of-the-art control architecture for ROV LATIS.

Edin received the Dipl. Eng. and M.S. degree in Electrical Engineering from the University of Zagreb, Croatia, in 1997 and 2001, respectively. In 2001 he joined the Mechatronics Research Centre, University of Wales, Newport, UK and took part in the EPSRC funded IMPROVES project. He received his PhD in Electrical Engineering from the University of Wales in 2004, with the thesis titled “Thruster Fault diagnosis and Accommodation for Over-actuated Open-frame Underwater Vehicles”.

ABSTRACT DEEPERSENSE



The core objective of the DeeperSense project is to combine different sensor modalities using data-driven methods to improve non-visual robotic perception. The methods are generic and can be applied to all robot application areas, but are demonstrated for underwater service robots. The concept is based on Inter-Sensoric Learning, where one sensor modality learns from another to deliver similar output in terms of accuracy and output type, or to improve the interpretation of data. This can refine and improve the perception capabilities of sensors. Three core algorithms, SONAVision, EagleEye, and SmartSeafloorScan, will be developed to fulfill the needs of use cases.

BIOGRAPHY NIMISH SHRENIK SHAH

Nimish Shrenik Shah is a researcher at the Marine Robotics team of the German Research Center for Artificial Intelligence, Robotics Innovation Center in Bremen, Germany. Before returning to Germany, he was a Master Student at the RAM Lab at University of Twente and research assistant at Fraunhofer IPA. At DFKI he investigates data-driven methods for multi-modal learning, 3D reconstruction.



ABSTRACT MAELSTROM



MAELSTROM

The presence of litter in the marine environment is becoming a global concern. A large percentage of the litter in the marine environment accumulates on the seafloor making it difficult the identification where it accumulates and, even more difficult to implement an efficient and eco-sustainable removal. For this reason, the development of new techniques for the monitoring and the removal is urgent. This is one of the aims of the EU co-founded H2020 Smart technology for Marine Litter SusTainable RemOval and Management (MAELSTROM) project, that allowed to map the presence of seabed macro litter hotspots close to the historical city of Venice (Italy), and in an abandoned aquaculture farm in the Venice coastal area by means of a high resolution multibeam echosounder and video inspections. In these areas, in September 2022 and between May and June 2023, an innovative an underwater cable-driven robot mounted on a floating platform to remove the seafloor macrolitter has been successfully tested in. During the tests, the robotic solution, selectively and efficiently cleaned the seafloor from several macro litter items using a gripping device. In this study, we present the results of the high-resolution

BIOGRAPHY MASSIMO CACCIA

Massimo Caccia graduated in Electronic Engineering at the University of Genova in 1991. In the period October 16, 2013 – October 15, 2017 and October 16, 2017 – May 10, 2018 he served as Director and Acting Director, respectively, of the CNR Istituto di Studi sui Sistemi Intelligenti per l'Automazione (ISSIA-CNR). After joining CNR in 1993, his theoretical and applied research activities focused on marine robotics, mainly addressing the topics of modelling and identification, cooperative guidance and control, vision-based motion estimation and control, and embedded real-time platforms and architectures for Unmanned Marine Vehicles. He is among the European pioneer researchers in the field of unmanned surface vehicles and, with his research group, he developed pioneer research projects on the application of robotic technology to maritime safety. Research results, certified by more than 200 publications in international books, journals and conferences, led to the partnership in a number of EC, national and regional projects. He recently coordinated the projects Blue RoSES (EMFF), and MATRAC-ACP (Interreg Maritime Italy-France), and is coordinating the projects ARES (PON), and MODA (PNRM), that represent state-of-the-art R&D in the definition of guidelines and codes of practice for the operation of robotic vehicles in harbour waters and coastal water, and in the integration of shipbuilding and robotics according to the vision identified by Blue Italian Growth National Technology Cluster

ABSTRACT ECOBOTICS.SEA



Neuromorphic Computing
Architectures for Robot Vision in
Marine Harsh Environments The
design of robots that interact

autonomously with the environment and exhibit complex behaviors is an open challenge that can benefit from understanding what makes living beings fit to act in the world. Neuromorphic engineering studies neural computational principles to develop technologies that can provide a computing substrate for building compact and low-power processing systems. In this talk shows why the robots with neuromorphic technologies – from perception to motor control – represents a promising approach for the creation of robots which can be more intelligent and autonomous. This keynote addresses computational aspects of implementing robotic and computer vision algorithms that are based on neurocomputing paradigms for robot vision and harsh environments. Different algorithms have been translated to this new approach where the multi-sensing data with probabilistic distributions, are used to navigate in marine and harsh environments. In the talk we address our current attempt to implement efficient “haze removal” CNN to remove the distortion from underwater images and increase the quality and performance of the machine learning programs which improves navigation of marine robots.

BIOGRAPHY JORGE DIAS

Jorge Dias has a Habilitation and Ph.D. degree on EE and Coordinates the Artificial Perception Group from the Institute of Systems and Robotics from the University of Coimbra, Portugal. He is Full Professor at Khalifa University, Abu Dhabi, UAE and Deputy Director from the Center of Autonomous Robotic Systems from Khalifa University. His expertise is in the area of Artificial Perception (Computer Vision and Robotic Vision) and has contributions on the field since 1984. He has been principal investigator and consortia coordinator from several research international projects, and coordinates the research group on Computer Vision and Artificial Perception from KUCARS. Jorge Dias published several articles in the area of Computer Vision and Robotics that include more than 300 publications in international journals and conference proceedings and recently published book on Probabilistic Robot Perception that addresses the use of statistical modeling and Artificial Intelligence for Perception, Planning and Decision in Robots. He was the Project Coordinator of two European Consortium for the Projects “Social Robot” and “GrowMeUP” that were developed to support the inclusivity and wellbeing for of the Elderly generation.

ABSTRACT SEACLEAR



Today's oceans contain 26-66 million tons of waste, with approximately 94% located on the seafloor. SeaClear — short for SEarch, identificAtion

and Collection of marine Litter with Autonomous Robots — is a Horizon 2020 funded project that aims at automating the process of searching, identifying, and collecting marine litter, using a team of autonomous robots that work collaboratively. Following the success of the Horizon 2020 SeaClear project, SeaClear 2.0 (Scalable Full-cycle Marine Litter Remediation in the Mediterranean: Robotic and Participatory Solutions) will go beyond the technological innovation of the previous SeaClear project. SeaClear 2.0 is an integral part of the EU Mission "Restore our Ocean and Waters", aiming to protect and clean up our seas and waterways through applied research and innovation and citizen participation, hoping to catalyse investments from the Blue sector. The project will integrate cutting-edge technologies into a comprehensive approach that engages communities in finding solutions to marine litter pollution, increases waste value, and contributes to science-based policy making.

BIOGRAPHY IVANA PALUNKO

Ivana Palunko is an Associate Professor at the Department of Electrical Engineering and Computing, University of Dubrovnik. She earned her Ph.D. in 2012 from the University of New Mexico (UNM), Albuquerque, NM and her engineering degree in 2007 from the University of Zagreb, Faculty of Electrical Engineering and Computing (UNIZG-FER). From 2012 until 2014, she was a postdoctoral researcher at UNIZG-FER and a visiting researcher at TU Munich. She authored and co-authored more than 35 peer-reviewed publications and has participated as a researcher and a PI in more than 18 national and international projects. Since 2019, she has been the Head of LARIAT – Laboratory for intelligent autonomous systems. Her research is mainly oriented in modeling, non-linear and adaptive control, Lyapunov stability, optimal control, reinforcement learning, and decentralized control with applications in robotics.

ABSTRACT NETTAG



In this talk the recent developments and results for the European research project NETTAG will be presented and discussed. This project addressed the problem of lost fishing gear and the development of technical tools and procedures for its environmental impact minimization in close collaboration with the fishermen community. The newly approved European project NETTAG+ addressing the further development of previous results and widening of application will also be presented.

BIOGRAPHY ALFREDO MARTINS

Alfredo is currently a senior researcher at the INESC TEC Center for Robotics and Autonomous Systems belonging to its coordination council board since 2011. He is also a Professor at ISEP Porto Polytechnic Engineering School in the Electrical Engineering department since 2003. Currently participates in various marine robotics research projects and related initiatives such as European EIT Raw Materials UNEXUP project addressing the development of innovative robots for mine exploration, leads the robotics activities in the EU H2020 EU-SCORES project developing mixed parks of offshore energy production. He was a key researcher on the European H2020 UNEXMIN and VAMOS projects addressing the development of robotic technologies for

underwater mining, namely the exploration of underground flooded mines (UNEXMIN) and the development of a robotic system for open-pit in water mining exploitation (VAMOS), lead the INESC TEC team in the European EASME NETTAG project addressing recovery of lost fishing nets with a robotic tool and has participated on the European FP7 Projects ICARUS and SUNNY, addressing respectively robotic systems for search and rescue and marine border surveillance applications. He also is involved in research projects for the deep ocean, having participated in the EDA (European Defence Agency) and national TURTLE, SIDENAV, and Deepfloat projects aiming to develop new materials and technologies for locomotion in the deep ocean. These projects have produced the first robotic autonomous hybrid deep sea lander (TURTLE). He currently participates in research on long term permanence at sea and industrial upscaling of these developments, funded by Portuguese ANI (Agência Nacional de Inovação). Alfredo has vast experience in marine robotics, having worked with autonomous underwater vehicles since 1998. He has participated in multiple marine robotic research projects with an extensive list of publications in both underwater and surface autonomous robots.

ABSTRACT SAIPEM



Saipem is an advanced technological and engineering key player in the energy market for the design, construction and operation of complex, safe and sustainable infrastructures and plants.

A company with distinctive skills and competences and high-tech assets, capable of identifying and developing multiple solutions to satisfy clients' needs. With more than 30,000 employees worldwide, Saipem operates in more than 60 countries and in offshore operations with a fleet of 40 vessels. Saipem has a solid track-record in the definition and implementation of the best strategies and technical-executive solutions for offshore E&C (Engineering and Construction) and Drilling. Among other players, provides design and construction of large scale plants and projects with high technological content. Energy transition is supported by advanced engineering services for the concept and design of innovative and modular industrialized solutions (spanning from offshore wind, CCUS, green hydrogen, underwater robotics, subsea structures, etc.). Saipem is also involved as EPC contractor and direction of projects for the creation of complex, safe and sustainable infrastructures at the service of Italy and the world. After a general introduction, the presentation will focus on illustrating the role and activities of Sonsub, as a key technological center within Saipem, for the delivery of innovation, special systems, automation and digital solutions to provide the Company competitive advantage and serve external market. Sonsub is a technology developer, kind of in-house OEM, embedded within Robotics, & Industrialised Solutions BU, able to span from conceptual to commercialization and operation phase.

BIOGRAPHY MARCO NOVELLO

Saipem SpA Offshore Technology and Innovation Manager for Robotics, Automation and Monitoring. Earned a Master's Degree in Electronics Engineering at University of Padova (Italy) in 2001 and has been working in Saipem since 2003. With over 20 years of experience in Offshore Oil&Gas industry and technologies, his experience is in particular on pipelay projects, subsea robotics and subsea field development and technologies, offshore renewables. In Saipem, covered a variety of roles starting from control system engineering for subsea pipe-trenching machines, monitoring systems, industrialization of subsea processing technology, digitalization of offshore projects and operations. From 2010 to 2017 he covered the role of head of Welding Control Systems in Saipem-Sonsub (based in Venice) and coordinating the control system development of the Saipem proprietary orbital welding system for pipelay. At present, he is Technology and Innovation Manager in Saipem Corporate coordinating the R&D activities for offshore Robotics, Automation and Monitoring and actively contributing to the application of autonomous underwater vehicles to the offshore renewables.

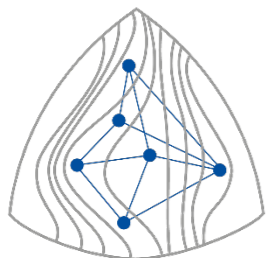
BIOGRAPHY LORENZO GRANELLI

Earned a Master degree in electronic engineering and post-graduate II level master in subsea electro-acoustic in 2008. Worked for Saipem, a public share engineering company with strong focus in the energy market, since 2008, having now 15 years of experience in subsea robotics. Within the 15 years covered many roles from control system developer to technical project manager and project manager of both R&D and executive projects, all having strong focus on subsea robotics topics (ROV, AUV, Drones), becoming a widely recognized expert in many different aspects of subsea robotic: from the engineering and purely technical topics to the management and operation of subsea systems. At present is managing R&D activities focused to improve operational capabilities of subsea drones (use of IA based planning engines; implementing subsea wireless comms network) and evaluating opportunities to apply Saipem's subsea robotic technologies to fields of application different from the traditional Saipem's core business.

BIOGRAPHY ADELINE KROLL

Adeline Kroll was born in Brussels (19/10/1966). She is a marine biologist with a M.Sc. thesis from the University of Washington (Seattle, Fullbright Fellow) on the ecology, behaviour and population of harbour seals on Protection Island (Strait of Juan de Fuca, Washington, US). While working on her thesis, she worked at the National Oceanic and Atmospheric Administration (NOAA, Seattle). She worked in various marine research stations in Belgium, France, Italy and in the Antarctic aboard the R.V. Polarstern to survey marine mammals and seabirds populations. She first joined the EC in 1994 at DG Environment and initiated the policy work on the Water Framework Directive. In the IPTS, a research centre from the EC (Sevilla, Spain), she worked on research projects related to socioeconomic and ecological aspects of water management for agriculture and mining. With a team, she elaborated the first European data base on research and innovation (RI) policies in the Member States ("ERA Watch", now labelled the Research and Innovation Observatory). In 2007, she joined DG RTD (now RI) to work on the European universities policies and on the professional status of European researchers. Under Framework Programme 7 (2007-2013), she drafted the first funding programme for less performing countries in obtaining RI European funding ("widening" countries). In parallel, she organised seven annual presidency conferences Week of Innovative Regions in Europe (WIRE) involving networks to exchange best practices on research and innovation activities at the regional level. She now works on involving National Contact Points (NCP) to help researchers from widening countries to submit higher quality proposals for RI funding, while continuing to work on research and innovation widening policies.

UWIN-LABUST



UWIN~LABUST
ERA CHAIR IN INTERNET OF UNDERWATER THINGS AT LABUST

UWIN-LABUST project aims to create conditions and opportunities at the University of Zagreb Faculty of Electrical and Engineering and Computing (UNIZG-FER) in Croatia for high quality researchers and research managers to move and engage to achieve excellence in a sustainable manner within the area of Internet of Underwater Things (IoUT), at the Laboratory for Underwater Systems and Technologies (LABUST). The objectives of the UWIN-

LABUST project are: 1) to recruit Prof. Roee Diamant from University of Haifa as ERA Chair holder who will establish his own team consisting of 3 post-docs, a technology transfer officer, and a group leader; 2) to achieve excellence in the research area of IoUT (a network of smart interconnected underwater objects) with particular focus on 3 strategic research domains: a) underwater sensor communications, b) underwater acoustic signal processing, and c) underwater collaborative autonomy; 3) to ensure sustainability of the achieved excellence; and 4) to increase UWIN-LABUST group scientific involvement and visibility. These objectives will be reached through a set of strategic measures: expert visits and outgoing study visits for providing knowledge transfer; research & innovation management trainings and establishment of Technology Transfer Office for transferring results from academia to industry; new MSc and PhD courses to ensure knowledge transfer to new generations; organization of workshops, summerschools

and conferences for strengthening links to industry, end-users, and the scientific community. Ministry of Science and Education of Croatia has provided a letter of commitment guaranteeing additional financial support for equipment and infrastructure to UWIN-LABUST project from European Structural and Investment Funds. Dean of UNIZG-FER also committed to ensuring additional financial research support.

BIOGRAPHY NIKOLA MIŠKOVIĆ

Nikola Mišković is a Full Professor at University of Zagreb, Faculty of Electrical Engineering and Computing (FER) where he teaches control engineering related courses. He is the Head of Laboratory for Underwater Systems and Technologies (LABUST, <https://labust.fer.hr/>). He participated in more than 20 EU projects, 4 Office of Naval Research Global, 2 NATO projects, and 7 national projects (coordinated 3). He published more than 70 papers in journals and conference proceedings in the area of navigation, guidance and control, as well as cooperative control in marine robotics. In 2022 Prof Nikola Mišković was awarded FER's Annual Science Award, and in 2020 IEEE Croatia Section Award for Outstanding Engineering Contribution for exceptional engineering contribution in the field of marine robotics, particularly innovative underwater robotic systems and autonomous surface vehicles. He received the annual State science award for 2015, awarded by the Croatian Parliament and in 2013 he received the young scientist award "Vera Johanides" of the Croatian Academy of Engineering (HATZ) for scientific achievements.

ABSTRACT BCTHUBS



BCThubs aims to build R&I capacities in a specific Blue Economy sector, that of Blue Culture technologies (BCT). BCT is a rather newly introduced technological field, supporting Underwater Cultural

Heritage (UWCH) in terms of scientific research, sustainable protection, restoration, accessibility, and valorisation/promotion. BCThubs wants to bring together the 4-helix actors working on UWCH that are scattered around Europe, and build strong long-term partnerships among them through the establishment of Excellence Hubs in Greece, Malta and Bulgaria. Although the new Hubs will be scoped regionally, they will be interconnected pursuing cross-border collaborations on common strategic goals and new value chains aligned with RIS3 and other EU policies (e.g. Green Deal). These will be reinforced through the development of a cross-border joint R&I Strategy for the Hubs' operation; and the implementation of specific innovative R&I prototype solutions (UW assets safeguarding, UW health & safety, etc.), critical for UWCH in Hub regions.

BIOGRAPHY POLYVIOS RAXIS

He is a mathematician with MSc in software engineering and AI. His specialisation is in AI models and content analytics, and in WEB services. He has accumulated experience of 20+ years working in international R&I projects, while in the last 5 years has been mainly engaged in international projects related to underwater technologies, underwater cultural heritage, and smart sustainable tourism. He has coordinated several international research or commercial projects, and he is co-author of 14 scientific publications. The last 12 years he is the director of the R&D department of ATLANTIS in Greece.

ABSTRACT INNO2MARE



Strengthening the capacity for excellence of Slovenian and Croatian innovation ecosystems to support the digital and green transitions of maritime regions - Croatia and Slovenia are neighbours and among Europe's smaller countries. They are also united along the Adriatic. In this context, the EU-funded INNO2MARE project will boost maritime and connected industries. Specifically, it will support the digital and green transitions in western Slovenian and Adriatic Croatian innovation ecosystems. Implementing three pilot projects, INNO2MARE will address some of the key challenges related to maritime education and training, security and safety in marine traffic as well as energy conversion and management systems' efficiency. In addition to supporting the engagement of citizens in the innovation process and smart skills training, the project will reduce the innovation divide by connecting the innovation actors within the ecosystems. The Adriatic Sea is facing major impacts from overfishing and pollution. Solid waste, direct discharge of wastewater and oil pollution are key negative factors for the degradation of coastal and marine ecosystems. InnoMare strategic project will jointly develop and establish an innovation ecosystem model in the area of underwater robotics and sensors for purposes of monitoring and surveillance sector with a mission-oriented on the sustainability of the Adriatic Sea. InnoMare strategic project will tackle one of the main current challenges: increasing the effectiveness of the innovation activities in the relevant fields of the blue economy.

BIOGRAPHY SANDRA PERICA CVJETKO

Sandra's background is in advanced communication solutions, multimedia applications, industry robotics, autonomous operations in maritime and leadership. She has great passion for technology, innovative solutions, continuous learning and team spirit. Focus on industry digitalization, robotics and autonomous operations.

ABSTRACT MONUSEN



The MONUSEN project aims to increase the scientific excellence and innovation capacity of the Faculty of Electrical Engineering at the University of Montenegro (UoM) in the domain of Underwater Sensor Networks (USNs) by twinning with EU research-intensive institutions with strong expertise in the field: the National Research Council of Italy, the University of Zagreb Faculty

of Electrical Engineering and Computing, and Newcastle University. The project goals will be achieved by organizing staff exchanges and expert visits for knowledge transfer, on-site trainings for hands-on experience, a research-industry workshop for strengthening links to the marine robotics industry, and summer schools with an emphasis on strengthening links to potential USN end-users. Moreover, MONUSEN partners will jointly conduct research in the area of USN communication protocols, cooperative control of mobile underwater and surface vehicles, and USN security. The vision of the priority areas of research in the next period includes: (i) development of adaptive MAC protocols for acoustic communication with the aid of machine learning, (ii) design of cooperative formation control algorithms for multi-AUV (Autonomous Underwater Vehicle) systems, and (iii) design and implementation of decentralized authentication methods for UASNs.

BIOGRAPHY IGOR RADUSINOVIĆ

Igor Radusinovic holds a BSc from the University of Montenegro (1994) and MSc/PhD in telecommunication networks from the University of Belgrade (1997, 2003). He has been a professor at the University of Montenegro since 2013, with prior roles as teaching assistant, Assistant professor, Associate Professor, and as Head of the Department of Communications, Head of the Computer Center, and Head of the Study program of Electronics, Telecommunications, and Computers. He is also a member of the Management Board and Senate of the university. He has published over 150 scientific papers and is a reviewer for international journals. He is the coordinator of the European-funded MONtenegrin center for Underwater SEnsor Networks (MONUSEN) project. His research interests include Software Defined Networking, Acoustic communications, Network Function Virtualization, 5G, the Internet of Things, Artificial Intelligence, Tactile Internet, and Blockchain.

ABSTRACT SEATECHUB

This presentation will introduce projects relevant to marine technologies for blue economy sectors where the application of robotics is essential. The project 'Croatia-Cyprus Excellence Hub on Eco-Innovative Technologies for Healthy and Productive Seas' with the acronym 'SeaTechHub' will run from 2023 to 2027. The main goal of the SeaTechHub project is to strengthen Croatian and Cypriot place-based innovation ecosystems and improve access to excellence for research and innovation (R&I) actors by cross-border collaboration on a common strategy and alongside value-adding chains within the area of eco-innovative technologies for healthy and productive seas. The project focuses on five sectors: 1. Aquaculture and fisheries, 2. Smart ports, 3. Maritime security and protection, 4. Maritime technologies, and 5. Research and Education. These sectors are aligned with the Croatian and Cypriot Smart Specialization Strategies and are emerging or established sectors in the EU Blue Economy Report 2021. Another running project has the title 'Open Sea Aquaculture in the Eastern Mediterranean' with the acronym 'OS Aqua' and has been running since 2019. The OS Aqua project will deliver a roadmap enabling the creation of an Open Sea Aquacultural industry in Cyprus by developing the technical, regulatory, and financial framework. OS Aqua will design and identify suitable facilities that include cage, mooring, and monitoring equipment and areas for open sea aquaculture installation based on environmental, social, economic, and technological factors.

BIOGRAPHY IOANNIS KYRIAKIDES

Dr. Ioannis Kyriakides received his BSc degree in Electrical Engineering from Texas A&M University. He received his MSc and PhD degrees from Arizona State University. Throughout his graduate studies, he held a research associate position funded by the Integrated Sensing and Processing program and the Multidisciplinary University Research Initiative of the USA Department of Defence. In the final year of his PhD work, he received the University Graduate Fellowship of Arizona State University. His research interests include Bayesian target tracking, sequential Monte Carlo methods and heterogeneous data fusion and heterogeneous sensing node configuration. Applications of his research include localization of multiple RF sources, tracking surface vehicles using passive acoustic sensing, tracking multiple targets with constraints in motion and with heterogeneous agile sensing nodes, autonomous vehicle path planning for information acquisition, and identifying suitable areas for maritime activities such as aquaculture and renewable energy facilities. Dr. Kyriakides is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). Additionally, he is an Associate Professor at the Engineering Department at the University of Nicosia, where he is also the Associate Head of the Department of Engineering and the Electrical Engineering Program Coordinator serving on the Department's Postgraduate Program Committee. He is, moreover, a Senior Scientist at the Cyprus Marine and Maritime Institute (CMMI). At the CMMI Dr. Kyriakides leads the Maritime Digitalization Center. Dr. Kyriakides was the Project Coordinator for projects with a total budget of over € 7 M.

ABSTRACT IN2



Josip Madunić is an experienced IT professional with over 15 years of industry experience. He started his career as a software developer, honing his skills in Java and Oracle technologies. Currently serving as a Functional Architect at In2 d.o.o., Josip takes on the role of mentor and team

leader when needed. With his expertise in database modelling and system-to-system integrations, he has successfully contributed to the design and implementation of complex IT solutions. Josip's commitment to excellence has earned him recognition in his field. Outside of work, he enjoys spending quality time with his two children and pursuing his passion for windsurfing. Josip strives to continue making a significant contribution to the IT industry through his knowledge. In our presentation, we will discuss the successful integration of the Croatian Integrated Maritime Information System (CIMIS) with the CoastWatch Vessel Traffic System (VTS) using the Open IVEF standard. This integration has provided us with a powerful tool to enhance our maritime operations and decision-making processes. By seamlessly connecting CIMIS with CoastWatch VTS, we can now effectively utilize the received data across various aspects of our system. This includes leveraging real-time vessel tracking, analyzing vessel movements, optimizing traffic management, and ensuring regulatory compliance. By effectively harnessing the data received through this integration, we can better monitor and manage our maritime activities within the CIMIS ecosystem.

BIOGRAPHY JOSIP MADUNIĆ

Josip Madunić is an experienced IT professional with over 15 years of industry experience. He started his career as a software developer, honing his skills in Java and Oracle technologies. Currently serving as a Functional Architect at In2 d.o.o., Josip takes on the role of mentor and team leader when needed. With his expertise in database modelling and system-to-system integrations, he has successfully contributed to the design and implementation of complex IT solutions. Josip's commitment to excellence has earned him recognition in his field. Outside of work, he enjoys spending quality time with his two children and pursuing his passion for windsurfing. Josip strives to continue making a significant contribution to the IT industry through his knowledge.

ABSTRACT PASSPORT



PASSport initiative aims to address the main objective of Directive 2005/65/EC [3] on enhancing port security which is about to complement the measures adopted in 2004 by means of Regulation (EC) No 725/2004 [4] on enhancing ship and port facility security. The Directive complements the mechanism provided for by establishing a security system for all of the port area, in order to ensure a high and equal level of security for all European ports. Around one thousand of these ports

fall within the scope of the Directive. The European Commission asked the Joint Research Centre (JRC) to carry out a study on the implementation of the Directive in European ports, namely "Study on the technical aspects of port security (TAPS II)". The final report proposed a methodology with two successive stages of checks, one defining port facilities and characteristics forming part of the port, and the other identifying, by means of a risk analysis, the port boundaries so as to establish the most efficient port security & safety.

PASSport proposition Considering the above scenario, the PASSport consortium is proposing an Emergency Management Platform (referred as EMP) in order to guarantee the following main functionalities:

✓ Measurement of threats awareness and awareness-raising among players. Once the assets and infrastructure which need to be protected are identified against the threats and risks of intentional illegal action facing port activities, the PASSport platform proposes designing and implementing appropriate measures which can be used to counteract threats, at each of the three risk

levels identified (normal, increased, high), by means of specific procedures and by using technical equipment tailored to the needs of ports and which make it possible to provide the right response to the potential vulnerability of infrastructure.

✓ Inspection and supervision of port security areas. The PASSport platform is providing proper HMI to monitor, in an appropriate and regular manner, port security and the implementation of relevant procedures. In particular, by integrating dedicated sensors in procedures catalogues (also for emergency situations) the platform provides the operator with an overall security index and indicates activities to be followed in case of alert.

BIOGRAPHY ALESSANDRO RIDOLFI

Alessandro Ridolfi is currently a Research Fellow (Assistant Professor) of the Department of Industrial Engineering (DIEF) of the University of Florence (UNIFI). He is also Adjunct Professor at Syracuse University in Florence, since 2015, teaching Dynamics. In 2014 he received the Ph.D. degree in Industrial Engineering from UNIFI. In 2010 he graduated in Mechanical Engineering at UNIFI. At the beginning of his PhD he worked on railway vehicle localization and wheel-rail adhesion modelling. His current research interests are: underwater and industrial robotics, sensor-based navigation of vehicles, vehicle dynamics and bio-robotics. Alessandro Ridolfi worked as a Researcher and Assistant of the Coordinator within the FP7 project

ARROWS (ARchaeological ROBot systems for the World's Seas, 2012-2015), funded by the EU under grant agreement no. 308724. He is also working on project SUONO (Safe Underwater Operations iN Oceans, 2014-2017, <https://www.suonoproject.com/language/en/home-eng/>) funded by the Italian Ministry of University, Education, and Research in the framework of the competitive Call Smart Cities, challenge Sea Technologies, and on other European project (e.g. he is currently PI for UNIFI for the H2020 PASSport project, <https://h2020-passport.eu/>). He is co-author of many journal and conference papers on robotic and mechatronic topics, with particular focus on underwater robotics.

ABSTRACT INNOVAMARE



negative factors for the degradation of coastal and marine ecosystems. InnovaMare strategic project will jointly develop and establish an innovation ecosystem model in the area of underwater robotics and sensors for purposes of monitoring and surveillance sector with a mission-oriented on the sustainability of the Adriatic Sea. InnovaMare strategic project will tackle one of the main current challenges: increasing the effectiveness of the innovation activities in the relevant fields of the blue economy.

The Adriatic Sea is facing major impacts from overfishing and pollution. Solid waste, direct discharge of wastewater and oil pollution are key

BIOGRAPHY MATEO IVANAC

Mr. Mateo Ivanac is Chief Executive Officer of the InnovaMare Project. He has over 10 years of experience in different organizations in leadership positions with over 25 mil € of projects developed and implemented in the fields of research and innovation, organization development and social entrepreneurship. He is Adjunct Professor at the University North and Head of Innovation Factory CIRAZ.

ABSTRACT MARBLE



MARBLE



universities, research organizations, business clusters, and a digital innovation hub. The main challenges tackled in this project are the need for intersectoral and technological skills in Blue Economy education and the lack of an international interdisciplinary sustainable-minded Master programme dedicated to Maritime Robotics in Blue Economy.

The main goal of the MARBLE project is to raise competences and skills in maritime robotics application in the domain of blue economy (topic 1) by supporting the preparation of an innovative joint master programme “MARBLE – Maritime Robotics in Blue Economy” and implementation of joint training organized by a network of

BIOGRAPHY NIKOLA MIŠKOVIĆ

Nikola Mišković is a Full Professor at University of Zagreb, Faculty of Electrical Engineering and Computing (FER) where he teaches control engineering related courses. He is the Head of Laboratory for Underwater Systems and Technologies (LABUST, <https://labust.fer.hr/>). He participated in more than 20 EU projects, 4 Office of Naval Research Global, 2 NATO projects, and 7 national projects (coordinated 3). He published more than 70 papers in journals and conference proceedings in the area of navigation, guidance and control, as well as cooperative control in marine robotics. In 2022 Prof Nikola Mišković was awarded FER's Annual Science Award, and in 2020 IEEE Croatia Section Award for Outstanding Engineering Contribution for exceptional engineering contribution in the field of marine robotics, particularly innovative underwater robotic systems and autonomous surface vehicles. He received the annual State science award for 2015, awarded by the Croatian Parliament and in 2013 he received the young scientist award “Vera Johanides” of the Croatian Academy of Engineering (HATZ) for scientific achievements.

ABSTRACT ILLIAD



Digital Twins of the Ocean The Iliad Digital Twins of the Ocean, an EU funded project, builds on the assets resulting from two decades of investments in policies and infrastructures for the blue economy and aims at establishing an interoperable, data-intensive, and cost-effective Digital Twins of the Ocean. It follows the System of Systems approach, integrating the plethora of existing EU Earth Observing and Modelling Digital Infrastructures and Facilities. The combination of geovisualisation, immersive visualization and virtual or augmented reality will allow users to explore, synthesize, present, and analyze the underlying geospatial data in an interactive manner. The project includes number of Digital Twin pilots and during this talk, Water Quality pilot that NTNU leads together with Sintef Ocean and Fraunhofer, will be presented.

BIOGRAPHY ANTONIO VASILJEVIĆ

Dr. Antonio Vasiljević (M) is a research project manager at the Applied Underwater Robotics Laboratory (AURLab), Norwegian University of Science and Technology where he is responsible for full lifecycle of research projects, from securing funds, implementation, delivering research results and reporting. Previously, Antonio acted as a Senior and Leading Researcher at the Laboratory of Underwater Systems and Technologies at University of Zagreb Croatia where he was project manager or key researcher in number of projects related to marine robotics, mainly funded by European FP7 and Horizon programmes. Before returning back to academia in 2009, he worked in various engineering and senior positions in marine industry. He is an author and co-author of more than 50 papers published in journals and at conference proceedings. His research interests cover broad area of marine robotics and marine technology in general and their applications.

ABSTRACT GEOIMAGING



Geoimaging is a cutting-edge geospatial technology company based in Nicosia, Cyprus. With a strong focus on providing innovative solutions for remote sensing, earth observation, and geospatial analysis, Geoimaging has established itself as a leading player in the field. The company specializes in harnessing the power of satellite imagery, aerial photography, and other geospatial data sources to extract valuable insights and provide comprehensive geospatial solutions for a wide range of industries. By leveraging advanced image processing techniques, data analytics, and machine learning algorithms, Geoimaging enables businesses, governments, and organizations to make informed decisions, optimize operations, and gain a competitive advantage. Geoimaging offers a diverse range of services tailored to meet the specific needs of its clients. These services include satellite image acquisition and processing, orthorectification, image enhancement, change detection, land cover classification, terrain modelling, and geospatial data integration. The company's team of skilled professionals combines their expertise in geospatial science, remote sensing, and software development to deliver accurate, reliable, and actionable geospatial information. Through its state-of-the-art infrastructure and partnerships with leading satellite imagery providers, Geoimaging ensures access to high-resolution and up-to-date imagery from around the world. This allows clients to monitor environmental changes, track urban development, assess natural resources, and plan infrastructure projects with precision and efficiency. Geoimaging also places a strong emphasis on research and development, continuously exploring

new technologies and methodologies to enhance its services and stay at the forefront of the geospatial industry. The company actively collaborates with academic institutions, government agencies, and industry partners to drive innovation and contribute to the advancement of geospatial science. Overall, Geoimaging stands as a reliable and forward-thinking geospatial technology company in Nicosia, offering comprehensive geospatial solutions to support decision-making, planning, and monitoring across various sectors. With its expertise, cutting-edge technology, and commitment to excellence, Geoimaging empowers clients to unlock the full potential of geospatial data and gain valuable insights for a sustainable future.

BIOGRAPHY ELENA VALARI

Elena Valari (Female), (HO-GEO) is a research software engineer in IT projects and Chief Technical Leader in GeoImaging Ltd. She holds a degree in Computer Science from the Aristotle University of Thessaloniki, Greece in 2008. In 2010, she received her Master in Information Systems, Department of Informatics, Faculty of Sciences, and Aristotle University of Thessaloniki., She received her PhD in Spatial Planning from the Department of Spatial Planning and Development of the Faculty of Engineering, Aristotle University of Thessaloniki. She has participated as a Work Package leader and/or project team member in more than 10 co-funded research projects (H2020, AAL, EUROSTARS, Erasmus+, EDIDP etc). She has participated in many workshops and seminars related to Web development, GIS systems, Laser scanning etc. Finally, she has also 10 peer-reviewed publications, mainly in the field of data mining and geoinformatics.

ABSTRACT OCEANDRONE

In any domain OCEANDRONE is an advanced smart platform driven by a proprietary artificial intelligence system that enables the autonomous acquisition and transmission of data in absolute safety and continuity with an operative range of several months. OCEANDRONE will be coming to market with 2 very innovative characteristics: One is a unique, first-of-its-kind, "patent pending" Fully Retractable Sail and the second is a very advanced Energy Management System (EMS), giving very extended Drone Endurance capability. The Fully Retractable Sail permits OCEANDRONE superlative capabilities to safely operate in very critical marine environmental states (Harsh conditions) as well as giving OCEANDRONE a total stealth feature, in case of any threat as an example but not limited to Surveillance operations, Patrolling, etc. The second distinguishing feature is regarding a full optimized combination of Green Energies (Solar Panel, Wind Sailing, Hydrogenator and Fuel Cell), with an intelligent EMS allowing to operate for a long endurance with zero carbon emissions.

BIOGRAPHY STEFANO MALAGODI

Stefano has over 25 years' experience in the naval and offshore industries. After serving in the Italian Navy as an officer, he began working at Fincantieri Shipbuilding as a project manager assistant. He went on to hold various positions at Detroit Diesel Corporation and Sonsub (Saipem) before founding Innovo in 2012. As Executive Director, Stefano oversees the company's Research and Development (R&D) activities and is accountable for company and project sustainability, helping clients optimise their projects to achieve their carbon reduction and net zero emission goals. He is co-inventor of more than ten patents, a Chartered Engineer in both the UK and Italy and a fellow member of the Royal Institution of Naval Architects.

BIOGRAPHY MISLAV KOVAČ

Mislav Kovač holds a master's degree in geography and history from the University of Zagreb. He worked for most of his professional career in the field of regional development and EU funds. During this period he was appointed in different expert groups dealing with policy making and as a National representative in the Monitoring Committees for various programmes. Mislav joined Ministry of Regional Development and EU Funds in 2014 and since then he has been working in the European Territorial Cooperation field. He currently performs duty as a Head of Sector for Coordination of European Territorial Cooperation Programmes and Macro-Regional Strategies

CARLO KRASKOVIC

Project manager in the Maritime Technology Cluster of Friuli Venezia Giulia Region since 2015, involved in international relations and European and national projects for the cluster, focusses on collaborations with enterprises, research players and public administrations. Graduated with honours in International Political Sciences, collaborated with the University of Trieste focusing studies in the field of maritime and transport economics, had working experiences with stakeholders operating in logistics, maritime and nautical sector.

BIOGRAPHY MATEO ANTE BOSNIĆ

Mateo Ante Bosnić is a Senior Expert Advisor at the Directorate for Science and Technology of the Ministry of Science and Education of the Republic of Croatia. He is the National Contact Person (NCP) for the Partnership for Research and Innovation in the Mediterranean Area – PRIMA and for the activities from the JPI Oceans platform. He is also NCP for European Partnerships in general.

