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MIR

MARINE &
MARITIME
INTELLIGENT
ROBOTICS



MIR SYMPOSIUM 2026

PLANNING IN MARINE ROBOTICS Mission & Motion Planning

June 16-17, 2026

University of Toulon

SeaTech building M

Contact

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MIR SYMPOSIUM 2026 • PLANNING IN MARINE ROBOTICS

JUNE 16, 2026 • Amphitheater M

- 9:00** Welcoming of participants
- 9:30** **Introduction**
Prof. **Ricard MARXER**, Director of Master Erasmus Mundus MIR
- 9:45** **UTLN President Speech**
Prof. **Xavier LEROUX**, President, UTLN
- 10:00** **Distributed Underwater Acoustic Sources Estimation**
Keynote speaker presentation 1 – Prof. **Gianluca ANTONELLI**, Head of the Department of Electrical and Information Engineering, University of Cassino & Southern Lazio
- 10:45** Coffee break
- 11:00** **Mission management and motion planning of the 6000m AUV Ulyx - concepts, developments and real world results**
Jan OPDERBECKE, Deputy Director of the French Oceanographic Fleet, in charge of projects and innovation, IFREMER
- 11:45** **Poster session**
MIR students - Room M.001
- 12:45** Lunch Cocktail & Networking
- 14:00** **Towards Mission Autonomy in Multi-Domain Heterogeneous Robot Teams**
Keynote speaker presentation 2 – Dr. **Barbara ARBANAS**, Head of Research at the Centre of Excellence for Maritime Robotics and Technologies
- 14:45** **Innovative Nautical Safety & Protection by Enhanced Autonomous Reconnaissance - InSPEAR**
Alexandre RAMA, System and Operations Engineer, SeaOwl
- 16:00** End of first day sessions



Prof. **Barbara ARBANAS**

Head of Research at the Centre of Excellence for Maritime Robotics and Technologies (MARBLE) in Zagreb, Croatia

Barbara Arbanas Ferreira is Head of Research at the Centre of Excellence for Maritime Robotics and Technologies (MARBLE) in Zagreb, Croatia, where she leads research on maritime robotics and autonomous systems. Her work focuses on multi-robot coordination, distributed artificial intelligence, mission planning, and optimisation for heterogeneous robotic teams operating in complex marine environments. She holds a PhD in Electrical Engineering from the Faculty of Electrical Engineering and Computing at the University of Zagreb (UNIZG-FER), obtained in 2022.

She has contributed to numerous national and European research projects under FP7, Horizon 2020, and Horizon Europe, including subCULTron, EuRoC, SpECULARIA, and SeaTecHub. Her recent research focuses on resilient multi-domain robotic systems for maritime inspection, environmental monitoring, and intervention tasks. She has authored or co-authored one book chapter, 8 journal articles, and 14 conference papers.

She led the UNIZG-FER team to victory at the MBZIRC 2023 Maritime Grand Challenge, one of the world's most prestigious robotics competitions. For her contributions to robotics research and innovation, she received the Danubius Young Scientist Award and the IEEE Croatia Section Outstanding Engineer Award in 2025.

Towards Mission Autonomy in Multi-Domain Heterogeneous Robot Teams

Coordinating multi-domain heterogeneous robotic teams is essential for achieving real-world autonomy in complex environments. This talk explores how mission planning can advance beyond single-robot capabilities to orchestrate teams of aerial, surface, and underwater systems. We present approaches based on hierarchical mission structures, distributed coordination, and communication-aware planning, and discuss recent advances towards scalable, adaptive, and learning-enhanced frameworks. Examples from maritime deployments demonstrate how these methods enable robust, mission-ready systems. The talk concludes with an outlook on persistent autonomy and the increasing role of AI in mission-level robotics, including the challenges of operating across different media, where communication, localisation, and sensing capabilities vary significantly between aerial, surface, and underwater domains.

JUNE 17, 2026 • Amphitheater M

9:00 MIR programme review and future challenges

Prof. **Ricard MARXER** and Prof. **Vincent HUGEL**, UTLN; Prof. **Martin LUD-VIGSEN**, NTNU; Prof. **Pedro BATISTA**, IST-UL; Prof. **Pedro SANZ**, UJI

9:30 Student testimonial

MIR Intake 4 Student

09:45 Alumni 4 testimonial

MIR Intake 1/2/3 Alumni

10:30 Coffee break

10:45 Symposium conclusion & closing

Prof. **Ricard MARXER**, Director of Master Erasmus Mundus MIR

11:00 Graduation Ceremony

12:00 Lunch Cocktail



Prof. **Gianluca ANTONELLI**

Full Professor at the University of Cassino and Southern Lazio and Head of the Department of Electrical and Information Engineering. Fellow IEEE, Fellow AAIA and AIIA Fellow.

Gianluca Antonelli is Full Professor at the University of Cassino and Southern Lazio and head of the Department of Electrical and Information Engineering. He is Fellow IEEE since 2021, Fellow AAIA since 2023 and AIIA Fellow since 2024. His research interests include marine and industrial robotics, multi-agent systems, identification. He has published more than 60 international journal papers and 130 conference papers, he is author of the book *Underwater Robots* (Springer-Verlag, 2003, 2006, 2014, 2018) and co-authored the chapter *Underwater Robotics* for the Springer Handbook of Robotics, (Springer-Verlag, 2008, 2016). He has been involved in various roles in research projects funded under the European FP7 and H2020 schemes. He served both as independent expert and reviewer for the European FP/H2020/Horizon calls several times since 2006. From 2016 to 2021 he has been member elected of the «IEEE Robotics & Automation Society» (RAS) Administrative Committee, he has been coordinator elected of the EuRobotics Topic Group in Marine Robotics, he chaired the EuRobotics PhD award for 10 editions, he has been secretary of the IEEE-Italy section, he has been Chair of the IEEE RAS Italian Chapter, he has been Chair of the IEEE RAS Technical Committee in Marine Robotics. He is serving in the Editorial Board of International Journal of Robotics Research and served the Editorial Board of the IEEE Transactions on Robotics, IEEE Transactions on Control Systems Technology, Springer Journal of Intelligent Service Robotics, he has been Editor for the RAS Conference Editorial Board. He has been chief editor of the open access journal *Frontiers in Robotics & AI* specialty *Robotic Control Systems*. Since October 2020, he is top 1% in the field *Industrial Engineering & Automation* according to common metrics and the SCOPUS database (<https://data.mendeley.com/datasets/btchxktzyw>). Since December 2021, he is top 100 Italian scientists according to google scholar h-index in the category *Electronics and Electrical Engineering*.

<https://research.com/scientists-rankings/electronics-and-electrical-engineering/it>

<https://sites.google.com/unicas.it/gianluca-antonelli>

Distributed Underwater Acoustic Sources Estimation

Multiple underwater moving sensors are deployed to estimate the position and velocity of an acoustic source based on bearing-only measurements. For each vehicle, the measurements are characterized by poor observability. Communication of the data with other sensors is thus needed which, in turn, adds communication latency and packet loss to the problem. Solutions based on distributed algorithms are proposed which take into account those hard constraints. Optimal motion planning and multiple acoustic sources will also be addressed. Validation with numerical case studies and experimental results will be presented.