CAMS | 2025
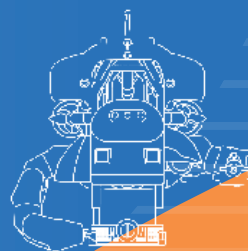
The 16th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles, 2025

PROGRAM

August 25th-28th, 2025
Wuhan, China

主办单位	国际自动控制联合会（IFAC） 中国自动化学会（CAA）
指导单位	中国造船工程学会
承办单位	华中科技大学
协办单位	华中科技大学船舶与海洋工程学院 船海智能装备与技术湖北省国际科技合作离岸中心 武汉市船海智能装备与技术"一带一路"联合实验室 船舶和海洋水动力湖北省重点实验室 水下无人运载平台湖北省重点实验室
支持单位	上海勘测设计研究院有限公司 中葡新能源技术中心（上海）有限公司 武汉睿控科技有限公司
赞助单位	北京灵思创奇科技有限公司 浙江凯富博科科技有限公司 北京度量科技有限公司 天津瀚海蓝帆海洋科技有限公司 沈阳元邦科技有限公司 大洋智能（江苏）科技产业有限公司 天津莱可智能科技有限公司 北京并行科技股份有限公司
出版支持	华中科技大学学报 中国海洋工程（英文版） 中国舰船研究 哈尔滨工程大学学报（英文版） 水下无人系统学报
技术支持	IFAC TC 7.2 Marine Systems
联合技术支持	TC 1.1. Modelling, Identification and Signal Processing TC 1.2. Adaptive and Learning Systems TC 3.2. Computational Intelligence in Control TC 3.3. Telematics: Control via Communication Networks TC 7.4. Transportation Systems TC 7.5. Intelligent Autonomous Vehicles

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第十六届国际自动控制联合会海洋系统、机器人技术及载运工具控制应用会议

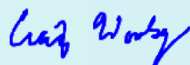|	
Organizing Institutions	International Federation of Automatic Control（IFAC） Chinese Association of Automation(CAA)
Guiding Institutions	The Chinese Society of Naval Architects and Marine Engineers
Host Institutions	Huazhong University of Science and Technology
Co-Organizing	School of Naval Architecture and Ocean Engineering, Huazhong University of Science and Technology International Science and Technology Cooperation Offshore Center for Ship and Marine Intelligent Equipment and Technology Wuhan Belt & Road Joint Lab of Ship and Marine Intelligent Equipment and Technology Hubei Key Laboratory of Naval Architecture and Ocean Engineering Hydrodynamics Hubei Province Key Laboratory for Unmanned Underwater Vehicle and Manipulating Technology
Supporting Organization	Shanghai investigation,Design & Research Institute Co., Ltd. Sino-Portuguese Centre for New Energy Technologies(Shanghai) Co., Ltd. Wuhan Ruikong Technology Co., Ltd
Sponsoring	Beijing LinksTech Co., Ltd. Zhejiang CathayBot Technology Co., Ltd. Beijing Nokov Science & Technology Co.,Ltd. Tianjin Hanhai Lanfan Marine Technology Co.,Ltd. Shenyang Unitech Technology Co.,Ltd. Hydrocean (Jiangsu) Technology Industry Co., Ltd Tianjin Laike Intelligent Technology Co.,Ltd Beijing Paratera Technology Co., Ltd.
Publication Support	Journal of Huazhong University of Science and Technology China Ocean Engineering Chinese Journal of Ship Research Journal of Marine Science and Application Journal of Unmanned Undersea Systems
Technical Support	IFAC TC 7.2 Marine Systems
Co-Technical Support	TC 1.1. Modelling, Identification and Signal Processing TC 1.2. Adaptive and Learning Systems TC 3.2. Computational Intelligence in Control TC 3.3. Telematics: Control via Communication Networks TC 7.4. Transportation Systems TC 7.5. Intelligent Autonomous Vehicles

欢 迎 词

　　第十六届国际自动控制联合会海洋系统、机器人技术与载运工具控制应用会议 (the 16th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles, IFAC CAMS 2025) 将于 2025 年 8 月 25-28 日在湖北省武汉市华中科技大学召开。本次会议由国际自动控制联合会与中国自动化学会共同主办, 中国造船工程学会指导, 华中科技大学承办, 船舶与海洋工程学院协办。

　　CAMS 2025 以"蓝色经济驱动的智能海洋系统"为主题, 重点聚焦智能船舶、海洋机器人、海洋油气平台及深海装备等前沿装备与技术领域, 致力于搭建学术界与产业界深度合作的桥梁, 共同推动海洋智能装备的技术创新与产业升级。

　　本次会议是 IFAC CAMS 旗舰会议, 首次在中国举办, 共吸引了 175 篇论文作者投稿、250 余位来自国内外顶尖科研机构、高等院校、领军企业以及行业组织的专家学者参会交流, 其中包括美国、德国、意大利、葡萄牙、挪威、丹麦、荷兰、韩国、日本、克罗地亚、俄罗斯、马来西亚等 16 个国家的 50 余名国际学者参会。大会非常荣幸地邀请到 14 位国内外知名专家作大会报告和专题研讨会报告。

　　在此, 我们谨代表会议主席团、国际程序委员会、本地组织委员会对所有作者及参会人员表示最衷心的感谢与最热烈的欢迎!感谢审稿人及编辑对投稿论文的严谨评审!感谢志愿者提供的热情服务!感谢大会报告和专题研讨专家们与大家一同分享他们最新的研究成果!向所有为本届会议顺利召开做出贡献的人士致以我们最真诚的谢意!

　　第十六届国际自动控制联合会海洋系统、机器人技术及载运工具控制应用会议欢迎您!

IPC 主席
弗吉尼亚理工大学

NOC 主席
华中科技大学

Welcome Remark

The 16th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles (IFAC CAMS 2025) will be held from August 25th to 28th, 2025 at Huazhong University of Science and Technology in Wuhan, Hubei Province, China. The conference is jointly organized by the International Federation of Automatic Control (IFAC) and the Chinese Association of Automation (CAA), guided by the China Society of Naval Architects and Marine Engineers (CSNAME), hosted by Huazhong University of Science and Technology (HUST), and co-organized by the School of Naval Architecture and Ocean Engineering (SNAOE).

CAMS 2025, themed "Intelligent Marine Systems Driven by the Blue Economy," focuses on cutting-edge equipment and technologies such as intelligent ships, marine robots, offshore oil and gas platforms, and deep-sea equipment. It aims to build a bridge for deep cooperation between academia and industry to jointly promote technological innovation and industrial upgrading of intelligent marine equipment.

This conference is the flagship event of IFAC CAMS and is being held in China for the first time. It has attracted submissions from 175 paper authors and over 250 scholars from top domestic and international research institutions, universities, leading enterprises, and industry organizations. More than 50 international scholars from 16 countries will attend the conference, including the United States, Germany, Italy, Portugal, Norway, Denmark, the Netherlands, South Korea, Japan, Croatia, Russia, and Malaysia. The conference is honored to have invited 14 well-known domestic and international experts to deliver keynote speeches and special seminar reports.

Here, on behalf of the Organizing Committee, International Program Committee, and National Program Committee, we extend our deepest gratitude to all authors and participants! We thank the reviewers and editors for their rigorous review of the submitted papers! We appreciate the enthusiastic service provided by the volunteers! We thank the experts delivering keynote speeches and special seminars for sharing their latest research achievements with everyone! We extend our sincerest gratitude to all those who contributed to the success of this event!

Welcome to the 2025 IFAC CAMS Conference!

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Virginia Tech

NOC Chair
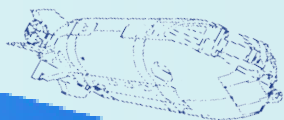Huazhong University of Science and Technology

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会务组 Conference Organizing Committee

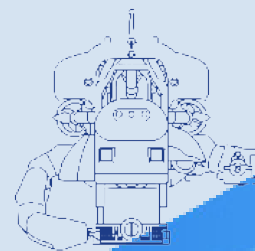| 项目分工	负责人
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华中科技大学国际学术交流中心
Huazhong University of Science and Technology Academic Exchange Service Centre
Miss Huang 027-87540068

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CONTENT

Program at a Glance

CAMS 2025 Technical Program Monday August 25, 2025	
Workshop on Marine Robots	
14:00-14:30	Building 8 Multi-Functional Hall Workshop MonEarly-AfternoonWorkshop Part I *Marine Robotics at Italian National Research Council: 30 Years of History and New Trends (Massimo Caccia, Director of Research, CNR-INM, Genova, Italy)*
14:30-15:00	Building 8 Multi-Functional Hall Workshop MonEarly-AfternoonWorkshop Part II *Recent Advances in Control of Multiple Autonomous Surface Vehicles (Prof. Peng Zhouhua, School of Marine Electrical Engineering, Dalian Maritime University)*
15:00-15:30	Building 8 Multi-Functional Hall Workshop MonEarly-AfternoonWorkshop Part III *Would It Be Possible to Design an Experimental Roadmap That Would Alow Us to Achieve the Dream of a Truly I-AUV? (Prof. Pedro J. Sanz, Computer Science and Engineering Department at Universitat Jaume I (UJI, Spain))*
15:30-15:45	Building 8 Multi-Functional Hall MonAfternoonCoffee-Break
15:45-16:15	Building 8 Multi-Functional Hall Workshop MonAfternoonWorkshop Part IV *Research on Inteligent Manipulation Operation Technology for Underwater Robots (Prof. Huang Hai, National Key Laboratory of Autonomous Marine Vehicle Technology, Harbin Engineering University)*
16:15-16:45	Building 8 Multi-Functional Hall Workshop MonAfternoonWorkshop Part V *Integrating Marine Robotics to Support Multidisciplinary Ocean Science (Dr. Antonio Vasiljevic, Department of Marine Technology, Norwegian University of Science and Technology)*
16:45-17:15	Building 8 Multi-Functional Hall Workshop MonAfternoonWorkshop Part VI *Optimal Planning and Motion Control of Unmanned Surface Vehices (Prof. Li Huiping, School of Marine Science and Technology, Northwestern Polytechnical University)*
17:15-17:30	Building 8 Multi-Functional Hall Workshop MonAfternoonWorkshop Part VII *Integrated Inteligent Equipment Simulation and Testing Platform for Industry Applications Such As Unmanned Systems, Robotics, and Motor Servo Control (RT Links Tech Company)*
17:30-17:40	Building 8 Multi-Functional Hall Workshop MonAfternoonWorkshop Part VIII *Master-Slave Robotic Systems for Hazardous Environment Applications (Cathay Bot Company)*
18:00-20:00	Dinner, Garden Restaurant Near Building 1 MonAfternoonDinner

CAMS 2025 Technical Program Tuesday August 26, 2025

08:30-09:00	Wutongyu Academic Inquiry Center Mingde Lecture Hall TueMorningOpening Ceremony
09:00-09:40	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk TueMorningPlenaries A *Prospects for the Development of Maritime Autonomous Surface Ships (Prof. Carlos Guedes Soares, Centre for Marine Technology and Ocean Engineering, Instituto Superior Técnico, Universidade De Lisboa)*
09:40-10:20	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk TueMorningPlenaries B *Advances in Control of Manta Ray-Inspired Soft-Bodied Underwater Vehicles (Prof. Pan Guang, School of Marine Science and Technology, Northwestern Polytechnical University)*
10:20-10:40	Wutongyu Academic Inquiry Center Mingde Lecture Hall TueMorningCoffee-Break
10:40-11:20	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk TueMorningPlenaries C *Advancing Marine Autonomy through Field Infrastructure and Scientific Applications (Prof. Martin Ludvigsen, Department of Marine Technology, Norwegian University of Science and Technology)*
11:20-12:00	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk TueMorningPlenaries D *Introduction to Subsea Heavy Equipment and Control Technology (Dr. Zhang Dinghua, Professor-Level Senior Engineer, CRRC SMD(Shanghai)Ltd.)*
12:00-13:30	Garden Restaurant Near Building 1 TueNoonLunch

13:30-15:18						
Building 8 Room 201 Invited Session TueEarly-AfternoonA *Advanced Methods for Identification and Control of Damage in Marine Materials and Structures*	Building 8 Room 302 Invited Session TueEarly-AfternoonB *Development and Application of Intervention-Autonomous Underwater Vehicles in Ocean Engineering (Part I)*	Building 1 Room 312 Invited Session TueEarly-AfternoonC *Sensing, Modeling and Control of Unmanned Underwater Vehicles (Part I)*	Building 1 Room 211 Invited Session TueEarly-AfternoonD *Planning and Control of Marine Vehicles (Part I)*	Building 1 Room 212 Invited Session TueEarly-AfternoonE *Novel Inteligent Sensors and Approaches for Marine Robotics Localization and Mapping*	Building 1 Room 311 Invited Session TueEarly-AfternoonF *Path-Folowing and Trajectory Tracking: From Classical Control Methodologies to Artificial Inteligence-Based Approaches (Part I)*	Building 1 International Exchange Office Meeting Room 112 Regular Session TueEarly-AfternoonG *Energy and Actuation Systems*

15:18-15:38	Coffee-Break, Building 1 and 8 TueAfternoonCoffee-Break

15:38-17:26						
Building 8 Room 201 Regular Session TueAfternoonA *Environmental Monitoring & Data Acquisition*	Building 8 Room 302 Invited Session TueAfternoonB *Development and Application of Intervention-Autonomous Underwater Vehicles in Ocean Engineering (Part II)*	Building 1 Room 312 Invited Session TueAfternoonC *Sensing, Modeling and Control of Unmanned Underwater Vehicles (Part II)*	Building 1 Room 211 Invited Session TueAfternoonD *Planning and Control of Marine Vehicles (Part II)*	Building 1 Room 212 Regular Session TueAfternoonE *Marine Vehicle Docking*	Building 1 Room 311 Invited Session TueAfternoonF *Path-Folowing and Trajectory Tracking: From Classical Control Methodologies to Artificial Inteligence-Based Approaches (Part II)*	1Building 1 International Exchange Office Meeting Room 112 Invited Session TueAfternoonG *Application of Triboelectric Nanogenerator in Ocean Energy and Ocean Engineering*

17:45-20:00	Dinner, Garden Restaurant Near Building 1 TueAfternoonDinner	20:30-22:00	TC Meeting, Building 8 Room 302 TueEveningTC Meeting

CAMS 2025 Technical Program Wednesday August 27, 2025	
08:30-09:10	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk WesMorningPlenaries A *Autonomy for Active Perception by Robot Swarms (Prof. Zhang Fumin, Chair Professor and Director of the Cheng Kar-Shun Robotics Institute at the Hong Kong University of Science and Technology)*
09:10-09:50	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk WesMorningPlenaries B *MARBLE - Centre of Excelence in Maritime Robotics and Technologies for Sustainable Blue Economy (Prof. Nikola Misovic, Head of Laboratory for Underwater Systems and Technologies, Faculty of Electrical Engineering and Computing, University of Zagreb*
09:50-10:10	Wutongyu Academic Inquiry Center Mingde Lecture Hall WesMorningCoffee-Break
10:10-10:50	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk WesMorningPlenaries C *Trusting the Machine at the Helm: Resilience, Awareness and Good Seamanship in the Age of Autonomous Ships (Prof. Roberto Galeazzi, Group Leader at the Technical University of Denmark 's Department of Electrical and Photonics Engineering)*
10:50-11:30	Wutongyu Academic Inquiry Center Mingde Lecture Hall Plenary Talk WesMorningPlenaries D *Elastic Adaptive Deep Reinforcement Learning for Autonomous Navigation of Marine Surface Vehicles (Prof. Ma Yong, State Key Laboratory of Maritime Technology and Safety, School of Navigation, Wuhan University of Technology)*

11:30-13:30	Garden Restaurant Near Building 1 WesNoonLunch

13:30-15:18						
Building 8 Room 201 Regular Session WesEarly-AfternoonA *Marine System Reliability: Fault Tolerance, Risk Assessment, and Communication (Part I)*	Building 8 Room 302 Invited Session WesEarly-AfternoonB *Renewable Marine Energy Systems: Modeling, Control, Health Monitoring*	Building 1 Room 312 Regular Session WesEarly-AfternoonC *Swarm Coordination, Vessel Shape Optimization, and Colaborative Estimation for Marine Vehicles (Part I)*	Building 1 Room 211 Regular Session WesEarly-AfternoonD *GNC for Marine Vehicles (Part I)*	Building 1 Room 212 Regular Session WesEarly-AfternoonE *Marine Perception (Part I)*	Building 1 Room 311 Regular Session WesEarly-AfternoonF *Machine Learning for Marine Control (Part I)*	Building 1 International Exchange Office Meeting Room 112 Regular Session WesEarly-AfternoonG *Hydrodynamics & Vessel Dynamics (Part I)*

15:18-15:38	Coffee-Break, Building 1 and 8 WesAfternoonCoffee-Break

15:38-17:08						
Building 8 Room 201 Regular Session WesAfternoonA *Marine System Reliability: Fault Tolerance, Risk Assessment, and Communication (Part II)*	Building 8 Room 302 Invited Session WesAfternoonB *Advanced Design and Maintenance of Offshore Wind Farms*	Building 1 Room 312 Regular Session WesAfternoonC *Swarm Coordination, Vessel Shape Optimization, and Collaborative Estimation for Marine Vehicles (Part II)*	Building 1 Room 211 Regular Session WesAfternoonD *GNC for Marine Vehicles (Part II)*	Building 1 Room 212 Regular Session WesAfternoonE *Marine Perception (Part II)*	Building 1 Room 311 Regular Session WesAfternoonF *Machine Learning for Marine Control (Part II)*	Building 1 International Exchange Offce Meeting Room 112 Regular Session WesAfternoonG *Hydrodynamics & Vessel Dynamics (Part II)*

17:30-21:50	Dinner, Yangtze River Cruise Dinner WesAfternoonDinner

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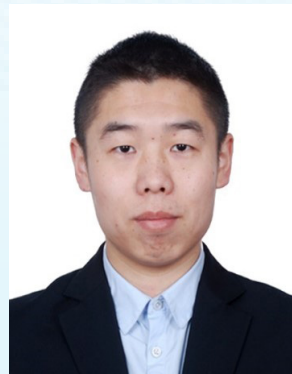Science and Technology,
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Transportation to Conference Venue

Wuhan Tianhe International Airport → HUST International Academic Exchange Center

Route 1: Subway (★ Recommended)

> Subway Entrance Location:
>
> Exit A: Terminal 3
>
> Exit B: Terminal 3
>
> Exit C: Intercity Station
>
> Exit D: Terminal 3

Route:

> Subway Line 2 (to HUST Station)
>
> Take Subway Line 2 at the airport, get off at HUST Station(Exit D), then walk to HUST International Academic Exchange Center
>
> Fare: ~10 RMB

Route 2: Taxi

Route: Drive along airport expressway, second ring Road, East Lake Tunnel, Yujia Lake Road, Luoyu Road

> Distance: ~50 km
>
> Time: ~60 minutes
>
> Fare: ~160 RMB
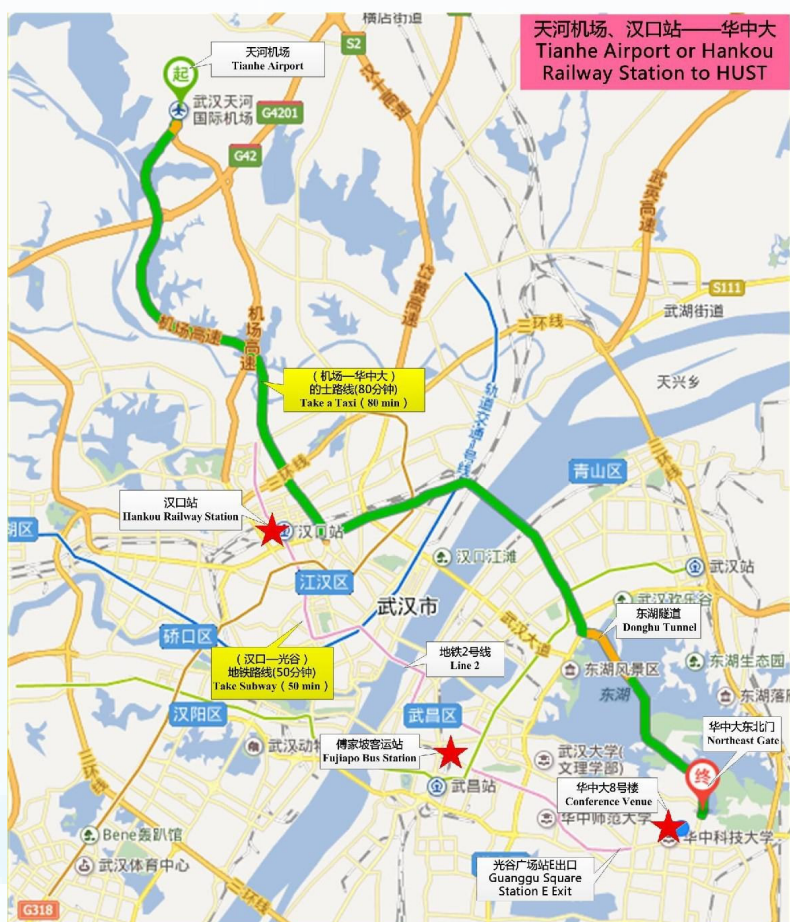
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Taxi Route from Wuhan Railway Station to HUST
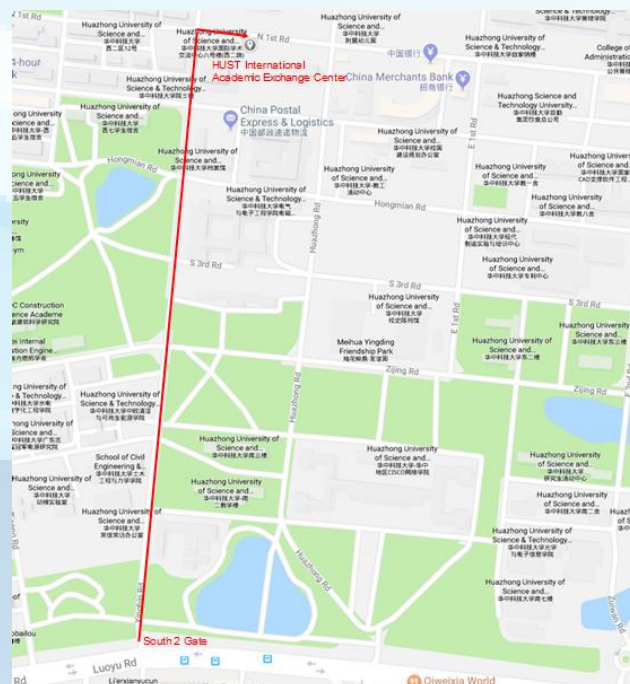
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Academic ExchangeCenter（Building 8）

梧桐语问学中心
Wutongyu Academic Inquiry Center

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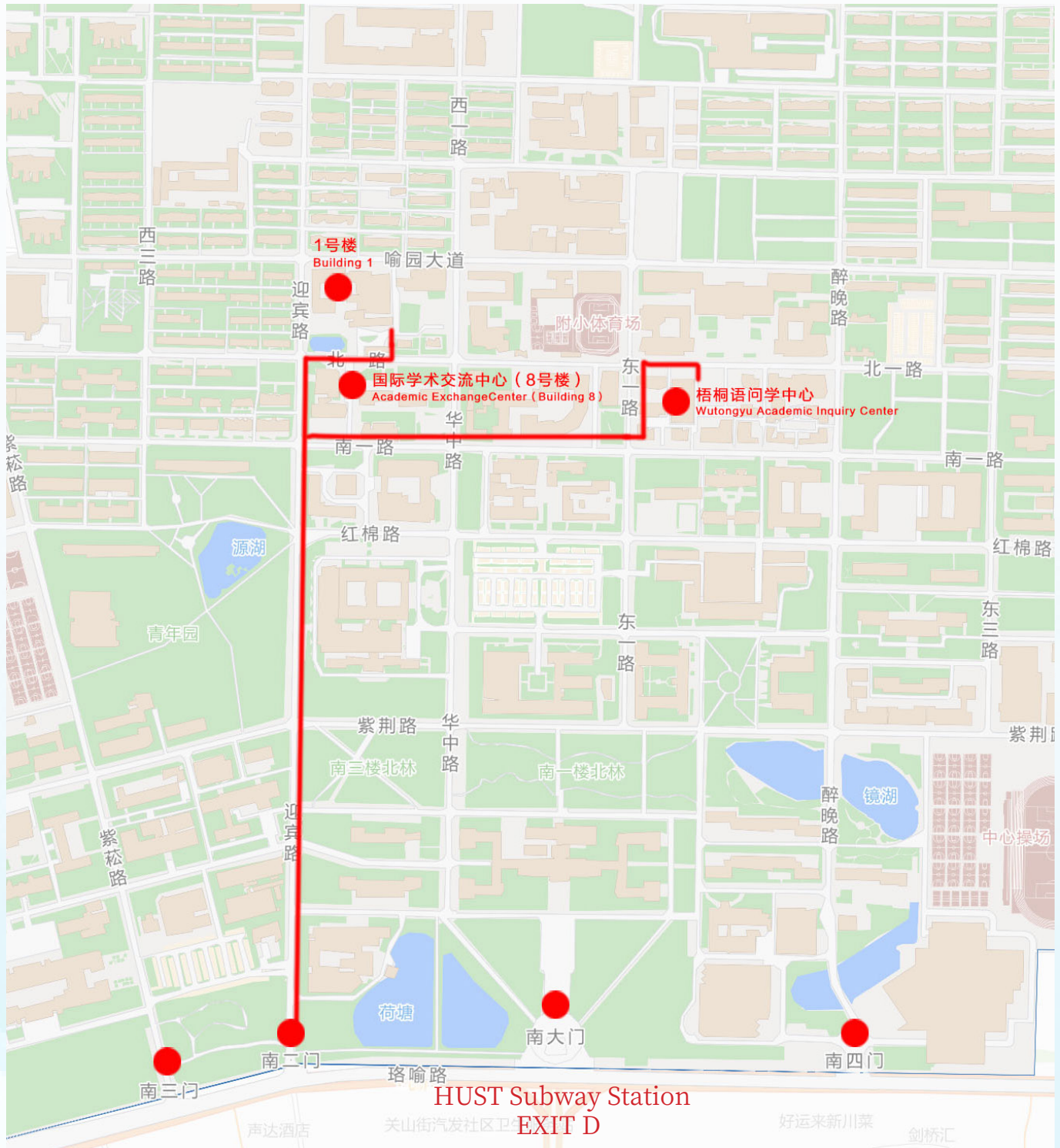
VENUE

Conference Venue

The conference will be held at the WuTongYu Academic Exchange Center of Huazhong University of Science and Technology, which primarily functions as a public communication platform for the university's academic exchange activities, providing venues for academic communication, achievement presentations, and forum lectures for faculty and students.

WuTongYu Academic Inquiry Center of HUST
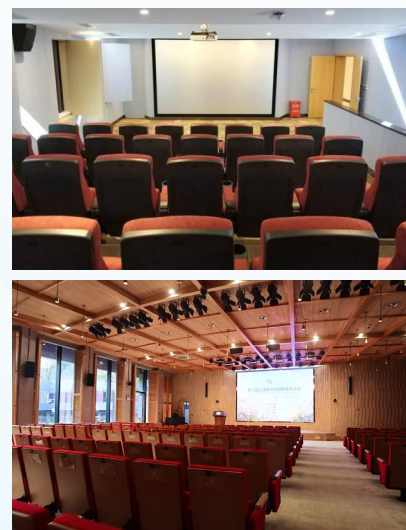
Hotel

Hyatt Regency Wuhan Optics Valley

10-15 minutes' walk from conference venue.
The average nightly rate is approximately 80-100 Euros.
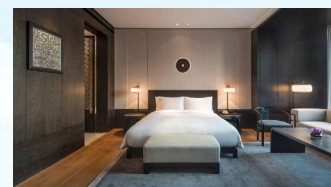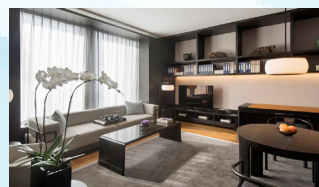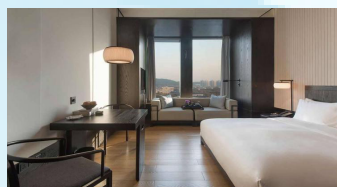
HUST International Academic Exchange Center in campus

The average nightly rate is approximately 50 Euros.
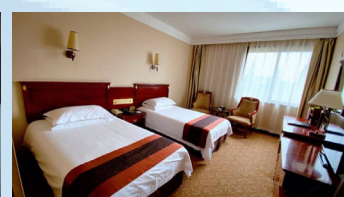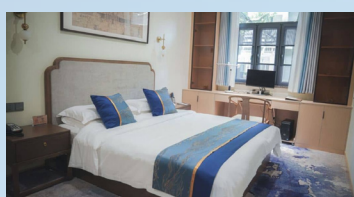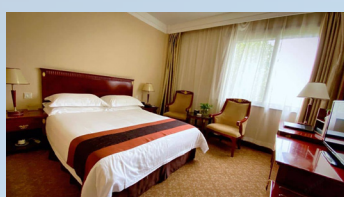
签到与现场注册时间地点介绍

Registration & On-site Payment Time and Venue

地点 Venue	时间 Time	报到 Registration	现场缴费 On-site Payment
武汉光谷凯悦酒店 Hyatt Regency Wuhan Optics Valley	8 月 25 日 -8 月 28 日 August 25th-28th	是 Yes	否 No
梧桐雨问学中心 WuTongYu Academic Inquiry Center	8 月 25 日 -8 月 28 日 August 25th-28th	是 Yes	是 Yes
国际交流中心 Huazhong University of Science and Technology Academic Exchange Service Centre	8 月 25 日 -8 月 28 日 August 25th-28th	是 Yes	是 Yes

会场网络

Conference Network

WIFI: IFACCAMS2025
Code: HUSTCAMS2025

More details about the dates and contents of the plenary lectures are provided below.

Prof. Carlos Guedes Soares

Title : Prospects for the Development of Maritime Autonomous Surface Ships

Session: Plenary Lecture A on Morning of Aug.26

Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall

Bio : Prof. Carlos Guedes Soares is a Distinguished Professor of the Engineering School (Instituto Superior Técnico) of the University of Lisbon. He was the founder in 1994 and is the Scientific Coordinator of the Centre for Marine Technology and Ocean Engineering (CENTEC), which is a research centre of the University of Lisbon, funded by the Portuguese Foundation for Science and Technology. He concluded his postgraduate studies at the Massachusetts Institute of Technology, USA, in 1976 and at the Norwegian Institute of Technology of the University of Trondheim in 1984. Since then, he has been at the University of Lisbon (formerly the Technical University of Lisbon, until 2013). He has supervised and co-supervised over 75 PhD students and has garnered more than 40,000 citations in the Web of Science, having a h-index of 91. In the Stanford World Ranking of the 2% highly cited scientists during their career, he ranked between first and fourth from 2019 to 2024 in the area of Civil Engineering (out of a total of 54,049 authors). In the same ranking, he was first among Portuguese scientists from all scientific areas every year from 2019 to 2024. He is now Co-Editor-in-Chief of the Journal of Marine Science and Application (Springer), the Journal of Reliability Science and Engineering (IOP Press) and the Autonomous Transportation Research Journal (Elsevier). He is also a member of the Editorial Board of more than 15 Journals. He is a Member of the Portuguese Academy of Engineering and a Fellow of SNAME, RINA, IMarEST, ASME and the Portuguese Engineering Association (Ordem dos Engenheiros). He is the Chairman of WEGEMT, the European Association of Universities on Marine Technology (40 universities). He received the "Career Award 2017" from the Ibero-Latin American Federation of Mechanical Engineering, the American Society of Mechanical Engineers Lifetime Achievement Award in 2018, and the China Friendship Award in 2024.

Abstract : An overview is presented of the developments and current challenges faced by Maritime Autonomous Surface Ships (MASS), which are defined by the International Maritime Organisation (IMO) as commercial vessels capable of operating with minimal or no onboard crew. Firstly, the presentation addresses the IMO Regulations, degree of autonomy, and prototypes in the operations. Then, examples of present-day MASS prototypes are presented, showing their main features. The impacts on the economy of shipowners and the tasks of seafarers are highlighted, addressing the advantages and disadvantages of MASS. Then, a brief presentation is made of various automatic systems that may be integrated into these vessels, including collision avoidance systems, path following, and path planning methods. Then the economic and efficiency benefits are discussed from the viewpoint of risk and safety, as well as potential cybersecurity threats. Finally, an overview of existing and proposed regulations governing their operation is presented.

Prof. Pan Guang

Title : Advances in Control of Manta Ray-Inspired Soft-Bodied Underwater Vehicles

Session: Plenary Lecture B on Morning of Aug.26

Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall

Bio : Prof. Pan Guang currently serves as the Dean of the School of Marine Science and Technology at Northwestern Polytechnical University and the Director of the Key Laboratory of "Unmanned Underwater Vehicle Technology" under the Ministry of Industry and Information Technology. He has received numerous honors, including the Shaanxi Youth Science and Technology Award, Shaanxi Provincial Teaching Excellence Award, Baosteel Outstanding Teacher Special Prize Nomination Award, NPU Outstanding Graduate Advisor, NPU Most Satisfactory Teacher, and the 2011 Scientific Chinese of the Year. With a long-term focus on the overall design of underwater vehicles and fluid dynamics, he has been engaged in both research and teaching. He has taught courses such as Fluid Mechanics, Torpedo Mechanics, and Advanced Fluid Mechanics. He has led over 30 major research projects, including the National Key R&D Program, National Natural Science Foundation of China, and the National 863 Program. His achievements include two Second Prizes of the National Technology Invention Award, two Second Prizes of the National Science and Technology Progress Award, more than 20 provincial and ministerial-level research awards, over 30 authorized invention patents, and the publication of more than 120 papers, with over 60 indexed by SCI and EI.

Abstract : Currently, China's maritime security faces dual challenges: ecological destruction has led to a sharp reduction in the area of islands and reefs, threatening territorial sovereignty, while the strict monitoring of key straits has hindered the forward deployment of

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underwater forces. There is an urgent need to develop new-concept submersibles that are bio-friendly, quiet, stealthy, and capable of long-endurance operations. The team led by Pan Guang at Northwestern Polytechnical University, inspired by the manta ray—which excels in efficient gliding, agile flapping, and energy-saving benthic movement—pioneered the concept of a gliding-flapping-benthic multimodal soft-bodied manta-ray-inspired submersible. This innovation has overcome four core technologies: "bionic dynamics theory, integrated gliding and flapping propulsion, multimodal motion control, and perception-coordinated operations." The team has developed the world's most comprehensive lineage of manta-ray-inspired submersibles, achieving six major capabilities: high maneuverability, long-range endurance, high bio-friendliness, high stealth, high disturbance resistance, and autonomous operation. This report focuses on the rigid-flexible coupling dynamics theory of multimodal manta-ray-inspired submersibles, the integrated propulsion technology combining bionic pectoral fin flapping and variable-wing gliding, the coordinated motion and disturbance-resistant control technology for gliding-flapping multimodal operations, and the multi-source perception and cluster coordination technology. It discusses the latest technological advancements and applications of soft-bodied manta-ray-inspired submersibles.

Prof. Martin Ludvigsen

Title : Advancing Marine Autonomy Through Field Infrastructure and Scientific Applications

Session: Plenary Lecture C on Morning of Aug.26

Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall

Bio : Prof. Martin Ludvigsen is a Professor at the Department of Marine Technology, and his research interests cover underwater robotics and its applications with a focus on perception and autonomy. Ludvigsen has extensive at-sea experience and has been involved in research projects in deep sea, in the upper water column, and the Arctic deploying robotic underwater vehicles.

He is co-founder and manager of the Applied Underwater Robotics Laboratory (AUR-Lab) at NTNU, Trondheim, Norway. AUR-Lab is a platform for multidisciplinary marine research at NTNU, facilitating research within both engineering disciplines and marine science by providing ROV, AUV and USV operations.

Abstract : AMarine autonomy progresses through well-defined technological challenges and essential applications in real-world experiments. The Applied Underwater Robotics Laboratory (AUR-Lab) provides operational and efficient infrastructure to enable field-driven robotic research together with marine science and industry. Together with SINTEF Ocean, NTNU expanded the AUR-Lab with Oceanlab focusing on underwater operations, marine observation, aquaculture, and unmanned vessels. These topics were further expanded in the Fjordlab, while also adding support for digital twins and interactive data visualizations, large-scale maritime testing and numerical ocean models.

Developing autonomy for underwater vehicles is an important research goal for AUR-Lab. To investigate the natural processes in the ocean such as temperature and salinity gradients and phytoplankton patchiness, adaptive mission planning has been addressed to enable the robots to adapt their operation to underway sensor readings. Model-based deliberative planning algorithms are used for both single and collaborating vehicles. These methods have been further improved and adapted to enable probability optimized mapping of zooplankton densities. Biomass is estimated by numerical modelling and measured with both optical and acoustical instruments. Heterogeneous networks of robotic vehicles combine both distributed and centralized planning approaches for zooplankton mapping. For ship hull inspection, end-to-end autonomous solutions have been developed starting with path planning, following through online perception, which enable real-time mission adaptation through interpretation and reporting. The planning, perception, control and navigation components of these autonomous systems have been further advanced to enable resident and persistent vehicles using subsea docking stations to obtain extended-duration operations independent of support vessels.

Dr. Zhang Dinghua

Title : Introduction to Subsea Heavy Equipment and Control Technology

Session: Plenary Lecture D on Morning of Aug.26

Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall

Bio : Dr. Zhang Dinghua, Professor-level Senior Engineer, is a leading figure in Shanghai's future space industry development. He pioneered China's deep-sea heavy-duty operations industry, with applications spanning trenching and cable-laying, construction and emergency repairs, and mineral mining. His contributions have provided instrumental solutions for China in safeguarding intercontinental network communications, deep-sea resource development, and maritime safety emergency response.Project achievements under his leadership have been widely deployed at domestic and international construction sites. His work has been honored with:

Science and Technology Progress Awards from Shanghai Municipality, Hunan Province, and Guangdong Province China's Outstanding Patent Award His team received the Science and Technology Innovation Team Award from the Chinese Society of Naval Architects and Marine Engineers.

Abstract : On the basis of analyzing the demand for deep-sea operations, this report discusses the technical requirements and challenges of deep-sea heavy operations, and introduces the engineering

applications of underwater communication, oil and gas, and maritime safety rescue by combining the product performance, industrial capabilities, and technological innovation of CRRC Shanghai SMD Company in underwater electrification and intelligence. Finally, the development trend of new technologies for underwater operation equipment is discussed.

Title : Autonomy for Active Perception by Robot Swarms
Session: Plenary Lecture A on Morning of Aug.27
Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall
Bio : Prof. Zhang Fumin is Chair Professor and Director of the Cheng Kar-Shun Robotics Institute at the Hong Kong University of Science and Technology, serving as Acting Head for the School of Mechanical and Aerospace Engineering. He is also Dean's Professor adjunct in the School of Electrical and Computer Engineering at the Georgia Institute of Technology. He received a PhD degree in 2004 from the Un.iversity of Maryland (College Park) in Electrical Engineering and held a postdoctoral position in Princeton University from 2004 to 2007. His research interests include mobile sensor networks, maritime robotics, control systems, and theoretical foundations for cyber-physical systems. He received the NSF CAREER Award in September 2009 and the ONR Young Investigator Program Award in April 2010. He is currently serving as the co-chair for the IEEE RAS Technical Committee on Marine Robotics, associate editors for IEEE Transactions on Automatic Control, and IEEE Transactions on Control of Networked Systems, IEEE Journal of Oceanic Engineering, and International Journal of Robotics Research. He is an IEEE Fellow.

Prof. Zhang Fumin

Abstract : Control theory and control technology have received renewed interests from applications involving service robots during the last two decades. In many scenarios, service robots are employed as networked mobile sensing platforms to collect data, sometimes in extreme environments in unprecedented ways. These applications post higher goals for autonomy that have never been achieved before, triggering new developments towards convergence of sensing, control, and communication. Identifying mathematical models of spatial-temporal processes from collected data along trajectories of mobile sensors is a baseline goal for active perception in complex environment. The controlled motion of mobile sensors induces information dynamics in the measurements taken for the underlying spatial-temporal processes, which are typically represented by models that have two major components: the trend model and the variation model. The trend model is often described by deterministic partial differential equations, and the variation model is often described by stochastic processes. Hence, information dynamics are constrained by these representations. Based on the information dynamics and the constraints, learning algorithms can be developed to identify parameters for spatial-temporal models. Certain designs of active sensing algorithms are inspired by animal and human behaviors. Our research designed the speed-up and speeding strategy (SUSD) that is inspired by the extraordinary capabilities of phototaxis from swarming fish. SUSD is a distributed active sensing strategy that reduces the need for information sharing among agents.   Furthermore, SUSD leads to a generic derivative free optimization algorithm that has been applied to solve optimization problems where gradients are not well-defined, including mixed integer programing problems. A perceivable trend in the control community is the rapid transition of fundamental discoveries to swarm robot applications. This is enabled by a collection of software, platforms, and testbeds shared across research groups. Such transition will generate significant impact to address the growing needs of robot swarms in applications including scientific data collection, search and rescue, aquaculture, intelligent traffic management, as well as human-robot teaming.

Title : MARBLE – Centre of Excellence in Maritime Robotics and Technologies for Sustainable Blue Economy
Session: Plenary Lecture B on Morning of Aug.27
Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall
Bio : Prof. Nikola Mišković received the Ph.D. degree in electrical engineering from University of Zagreb, Zagreb, Croatia, in 2010. He is a tenured Full Professor in control and marine robotics and the Head of the Laboratory for Underwater Systems and Technologies, Faculty of Electrical Engineering and Computing, University of Zagreb, Zagreb, Croatia. He is the Director of a European "Centre of Excellence in Maritime Robotics and Technologies for Sustainable Blue Economy – CoE MARBLE" funded under the Teaming call of the Horizon Europe Programme. He participated in 20 European projects (coordinated five), six Office of Naval Research Global projects, two NATO projects, one Schmidt Ocean Institute project, and 16 national projects. He authored/coauthored more than 130 papers in journals and conference proceedings in the area of navigation, guidance, and control, as well as cooperative control in marine robotics. Dr. Mišković was President of the Chapter for Robotics and Automation of the IEEE Croatian Section (2016–2019), member of the IEEE Oceanic Engineering Society Administrative Committee (2023–2025), and member of the IFAC Technical Committee on Marine Systems and Centre for Underwater Systems and Technologies.

Prof. Nikola Mišković

Abstract : Croatia is not only a top tourist destination with a stunning coastline – its shores and the Adriatic Sea also provide an ideal testbed

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for cutting-edge research in maritime robotics. The Centre of Excellence in Maritime Robotics and Technologies for Sustainable Blue Economy (CoE MARBLE) is a newly established research organization, funded by the European Commission, dedicated to strengthening Croatia's research and innovation capacities in this field, focussing on key research areas with the greatest potential to transform blue economy sectors: maritime robotics and autonomous systems, maritime green endurance, maritime Internet-of-Things, and maritime digital twins.

This talk will focus on recent work and research advancements within CoE MARBLE – from designing heterogeneous collaborative maritime robots, to monitoring underwater radiated noise, and developing technologies to support the aquaculture industry. A special highlight will be the experimental pilot sites being developed across the Adriatic, designed to host and connect researchers from around the globe.

Title：Trusting the Machine at the Helm: Resilience, Awareness and Good Seamanship in the Age of Autonomous Ships

Session: Plenary Lecture C on Morning of Aug.27

Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall

Bio：Roberto Galeazzi is an Associate Professor and Group Leader at the Technical University of Denmark's Department of Electrical and Photonics Engineering. With an MSc in Electronic Engineering from Università Politecnica delle Marche in Italy (2005) and a PhD in Automation and Control from DTU (2010), he has built his career at the intersection of theory and application. Dr. Galeazzi leads the Control, Robotics, and Embodied AI group, where his work advances control and estimation theory to make autonomous systems more resilient, intelligent, and reliable. His research spans motion control, multimodal sensor fusion, motion planning, condition monitoring, and fault-tolerant control—always with the goal of translating cutting-edge ideas into real-world solutions. An active contributor to the global control community, he has chaired the IFAC Technical Committee on Marine Systems (2019–2023) and currently leads the IFAC Coordinating Committee on Transportation and Vehicle Systems. Through his publications, international collaborations, and dedication to mentoring young engineers, Dr. Galeazzi continues to shape the future of autonomous and cyber-physical systems.

Prof. Roberto Galeazzi

Abstract：As autonomous and remotely operated ships transition from research to operational reality, trust in the machine at the helm becomes a decisive factor for safe and reliable adoption. This plenary will explore three core pillars of trustworthy maritime autonomy: resilient navigation, ensuring that every decision is based on verified and reliable information; robust situational awareness, enabling sound decision-making under operational uncertainty; and collision avoidance grounded in Good Seamanship, ensuring safe passage under all circumstances. These pillars will be examined in the context of current technological maturity and the evolving regulatory framework, highlighting both the opportunities and the challenges of large-scale deployment. The central message is clear: in the age of autonomous ships, Resilience, Awareness, and Good Seamanship are essential to making machines at the helm as safe, secure, and dependable as the most experienced mariners.

Title：Elastic adaptive deep reinforcement learning for autonomous navigation of marine surface vehicles

Session: Plenary Lecture D on Morning of Aug.27

Lecture Hall: Wutongyu Academic Inquiry Center Mingde Lecture Hall

Bio：Yong Ma (Senior Member, IEEE) is a professor at the school of navigation, Wuhan University of Technology, and serves as chief scientist for the intelligent navigation control of marine surface vessels at the State Key Laboratory of Maritime Technology and Safety. Prof. Ma is listed in the world ranking top 2% scientists' list. Serving as an associate editor for IEEE TII. His research focuses on intelligent navigation theory and technology for marine vessels and intelligent maritime safety systems. He has hosted a National Key R&D plan, published more than 70 journal papers including IEEE Trans, Scientia Sinica Technological Sciences, and received a first-class prize at the provincial/ministerial level as the lead investigator.

Prof. Ma Yong

Abstract：The complex and varied nature of marine environments poses a challenge to the training of decision-making networks using deep reinforcement learning (DRL). In response to the challenges faced by marine surface vehicles in perceiving dynamic motion environments and complex, rapidly changing situations, this presentation introduces a generalised elastic adaptive deep reinforcement learning framework. This framework uses a two-stage training approach involving function learning and optimisation learning. During the function learning stage, a task-adaptive observed behaviour classification technique is used to divide state and action spaces into subspaces and identify classic states and actions. During the optimisation learning stage, adaptive exploration within localised state subspaces is then constructed. Compared to traditional DRL approaches, this framework ensures that the decision-making network extracts stable and effective knowledge from complex state-action spaces, thereby enhancing the algorithm's adaptive capabilities. Finally, applications stemming from this research are outlined.

Workshop on Marine Robots

CAMS 2025 features the following workshop:

More details about the dates and contents of the workshops are provided below.

Title: Marine Robotics at Italian National Research Council: 30 Years of History and New Trends
Date: Afternoon, Aug. 25
Lecture Hall: Building 8 Multi-Functional Hall
Bio: Massimo Caccia served as Director and Acting Director, respectively, of the 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 such as Blue RoSES (EMFF), MATRAC-ACP (Interreg Maritime Italy-France), and so on, 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: The talk starts summarising fundamental results achieved by marine robotics researchers of the Italian National Research Council in the last 30 years, focusing on their contribution to the development of new concepts in prototype vehicle design and its strict interactions with new application fields, in particular in polar regions, where pioneer demonstrations were carried out. Ongoing research challenges for a small research team in a field that, finally, got a mature technology are presented and discussed in the second part of the talk.

Massimo Caccia

Title : Recent Advances in Control of Multiple Autonomous Surface Vehicles
Date: Afternoon, Aug. 25
Lecture Hall: Building 8 Multi-Functional Hall
Bio : Professor Zhouhua PENG currently serves as the Dean of the Marine Electrical Engineering at Dalian Maritime University, and the Director of the Key Laboratory of Dalian Key Laboratory of Swarm Control and Electrical Technology for Intelligent Ships. Professor Peng has been conducting research in the field of guidance and control of multiple autonomous surface/underwater vehicles. He has presided over more than 10 national-level projects. He has published more than 170 SCI papers, with more than 11,000 citations in Google Scholar and an H-index of 56 in Google Scholar. He has published 3 academic monographs and obtained 76 authorized invention patents. Achievements include winning the first-class and second-class Natural Science Prize of Liaoning Province, the first-class China Ocean Engineering Science and Technology Prize, and the second-class Natural Science Prize of Ministry of Education, all as the first rank. Honors include being selected as a National Young Top Talent, a Leading Talent of the Xingliao Talent Program in Liaoning Province, a Leading Innovative Talent in the Ministry of Transport, a recipient of the Special Government Allowance, an Advanced Worker in the National Transportation System, Elsevier Highly Cited Researchers, and Clarivate Highly Cited Researchers.
Abstract : Autonomous surface vehicles (ASVs) are characterized by low cost, high mobility, and high degree of autonomy and intelligence.They provide unique capabilities for performing various missions in complex sea environments without risking human lives. They can be deployed in numerous applications in either military or civil missions. In this talk, recent advances on control of multiple ASVs will be introduced including coordinated control of multiple ASVs, attack-defence of multiple ASVs, and path planning and control of large-scale ASVs.

Prof. Peng Zhouhua

Prof. Pedro J. Sanz

Title : Would it be possible to design an experimental roadmap that would allow us to achieve the dream of a truly I-AUV?

Date: Afternoon, Aug. 25

Lecture Hall: Building 8 Multi-Functional Hall

Bio : Pedro J. Sanz is Full Professor in the Computer Science and Engineering Department at Universitat Jaume I (UJI, Spain), and head of CIRTESU (Research Centre for Robotics and Underwater Technologies). He holds a B.Sc. in Physics by the University of Valencia (UV), M.Sc in Engineering (CAD/CAM) from the Technical University of Valencia (UPV) and a Ph.D. in Computer Engineering by UJI. Sanz has been appointed as Visiting Scientist at different Universities, like TUM (GERMANY, 2000 and 2016), Blaise Pascal (FRANCE, 2002), Bologna (ITALY, 2008). He was a Member of the Advisory Committee of the IEEE Systems Council (2008-12) and the Humanoids Competition Chair during "2014 IEEE-RAS International Conference on Humanoid Robots" (Madrid, 2014). Chair of several Tutorials and Workshops within outstanding International Conferences on Robotics (IROS, IFAC, ICMA). Sanz has served as Associate Editor of some outstanding Journals (IEEE RAM, IEEE SMC Part C). He has been the Coordinator of the Spanish Robotics Network (CEAIFAC, 2012-16), and his main research interests are devoted to Multisensory based Grasping and Dexterous Manipulation, Telerobotics and Human-Robot Interaction (HRI), all of them applied to real life scenarios, including assistive and underwater robotics.

Abstract : Seven years ago, during IROS 2018 (Madrid, Spain), was organized the Workshop: "New Horizons for Underwater Intervention Missions: from Current Technologies to Future Applications". The purpose of this talk is to provide an overview of the evolution and progress of this emerging technology, highlighting the pros and cons, and drawing on some lessons learned along the way. Recent years have enabled significant advances in critical technologies such as wireless communication, HRI, perception, and dexterous manipulation, to name a few. In fact, recent experiments involving CIRTESU (Research Centre for Robotics and Underwater Technologies, UJI, Spain), focusing on IMR (Inspection, Maintenance, and Repair) activities through new cooperative robotics strategies and with increasing use of stronger AI algorithms, and better mechatronic devices (for perception and action), suggest an optimistic roadmap for the next years. In short, the dream of achieving an autonomous underwater robotic intervention system (I-AUV) now seems more achievable than ever.

Prof. Huang Hai

Title : Research on Intelligent Manipulation Operation Technology for Underwater Robots

Date: Afternoon, Aug. 25

Lecture Hall: Building 8 Multi-Functional Hall

Bio: Huang Hai, Ph.D., is a professor and doctoral supervisor at the National Key Laboratory of Autonomous Marine Vehicle Technology, Harbin Engineering University, China. He has been engaged in research on autonomous detection/operation of underwater robots, remote control of underwater robots, and other related fields for many years. He has presided over the National Key Research and Development Program of China, key projects and joint key projects of the NSFC, and more than 20 projects for basic scientific research and development funds. He has published more than 90 papers and authorized more than 20 invention patents. As the first author, he was awarded the first prize for Scientific and Technological Progress by the China Society of Shipbuilding Engineers and the second prize for Scientific and Technological Progress in Heilongjiang Province.

Abstract : A spatial perception graph relationship network model has been established for underwater fuzzy target detection, and a spatial relationship inference and fuzzy feature enhancement module have been constructed; A visual tight coupled embodied fusion localization method with multi-phase plane matching compensation and dual attention mixed excitation have been proposed, in order to achieve accurate recognition and continuous tracking localization of complex fuzzy targets on the seabed. A multi task priority trajectory planning and online strategy reinforcement learning method have been proposed for underwater autonomous tasks, achieving multi-objective optimization of task decision-making and planning for underwater robot intelligent operations. A hand eye kinematic decomposition and adaptive uncalibrated coordination control model of UVMS have been established, and a generalized displacement recursive optimization with multi-view feature point fusion method based on virtual imaging have been proposed to achieve precise hand eye coordination control for underwater multi eye visual servoing. In the prospective study, the methods for resident inspection and operation of mother-child underwater robots on the seabed will be explored, targeting the National Key R&D Program currently under research.

Dr. Antonio Vasilijević

Title : Integrating Marine Robotics to Support Multidisciplinary Ocean Science
Date: Afternoon, Aug. 25
Lecture Hall: Building 8 Multi-Functional Hall
Bio : Dr. Antonio Vasilijević (M) is a Senior Advisor at the Applied Underwater Robotics Laboratory (AUR-Lab) at the Norwegian University of Science and Technology (NTNU). His research interests span a broad range of topics within marine robotics and marine technology, with a particular focus on their practical applications. He has been actively involved in numerous marine robotics projects, many of which have been supported by the European Horizon programme. Dr. Antonio Vasilijević brings extensive experience from both academia and industry, providing a dual perspective that bridges theoretical research and real-world implementation.

Abstract : The complex and varied nature of marine environments poses a challenge to the training of decision-making networks using deep reinforcement learning (DRL). In response to the challenges faced by marine surface vehicles in perceiving dynamic motion environments and complex, rapidly changing situations, this presentation introduces a generalised elastic adaptive deep reinforcement learning framework. This framework uses a two-stage training approach involving function learning and optimisation learning. During the function learning stage, a task-adaptive observed behaviour classification technique is used to divide state and action spaces into subspaces and identify classic states and actions. During the optimisation learning stage, adaptive exploration within localised state subspaces is then constructed. Compared to traditional DRL approaches, this framework ensures that the decision-making network extracts stable and effective knowledge from complex state-action spaces, thereby enhancing the algorithm's adaptive capabilities. Finally, applications stemming from this research are outlined.

Prof. Li Huiping

Title : Optimal Planning and Motion Control of Unmanned Surface Vehicles
Date: Afternoon, Aug. 25
Lecture Hall: Building 8 Multi-Functional Hall
Bio : Dr Huiping Li, Senior Member of IEEE, CAA, Professor at Northwestern Polytechnical University. His primary research focuses on model predictive control, navigation for unmanned systems, and intelligent decision-making and control. He is a recipient of the National Science Fund for Excellent Young Scholars, and he led several research projects, including Key Joint Program of the National Natural Science Foundation of China, and the Shaanxi Province Outstanding Young Scholars Program. He serves as the Chair of the IEEE Industrial Electronics Society Xi'an Chapter, and serves on the editorial boards of several journals, including IEEE TMECH, IEEE TIE, and IEEE/CAA JAS He was awarded the First Prize of Natural Science by the Chinese Association of Automation.

Abstract : Unmanned Surface Vehicles (USVs) are crucial tools for maritime operations, holding significant application prospects in both military and civilian fields. To addressing the urgent needs of USVs in terms of energy consumption, control performance, and safety in complex environments, this presentation primarily reports the economic planning and optimized control progress for USVs based on the model predictive control framework. The detailed design methods, theoretical and experimental results will be highlighted.

口头报告要求

Oral Presentation Requirements

每篇论文报告时间为 18 分钟 (15 分钟讲解 +3 分钟交流), 语言为英语, 报告人需要在会议开始前 15 分钟到达分会场将幻灯片文件的 PPT 版本和 PDF 版本同时复制到会务组指定的计算机上。每间分会场会议室会配备一个投影仪或电子屏幕, 以及一台预装了演示软件, 如微软 PowerPoint 和 Adobe Reader 的笔记本电脑。注 : 如果您计划使用自己的计算机, 请在分会场报告的当天早上 8:30 之前或者 14:00 之前完成现场测试。口头报告论文宣讲顺序参见会议手册或者网站 (https://ifac.papercept.net/conferences/scripts/rtf/CAMS25_ProgramAtAGlanceWeb.html）

The allocated time for each paper presentation is 18 minutes (15 minutes for presentation + 3 minutes for Q&A). All presentations must be delivered in English. Presenters are required to arrive at the parallel session venue 15 minutes before the session begins and copy both the PPT and PDF versions of their slide file to the computer designated by the organizing committee. Each parallel session room will be equipped with a projector or electronic screen, and a laptop pre-installed with presentation software such as Microsoft PowerPoint and Adobe Reader. Note: If you plan to use your own computer, please complete an on-site compatibility test before 8:30 AM or before 2:00 PM on the day of your presentation. The presentation order for oral sessions can be found in the conference handbook or on the conference website (https://ifac.papercept.net/conferences/scripts/rtf/CAMS25_ProgramAtAGlanceWeb.html).

Technical Program for Tuesday August 26, 2025

TueEarly-AfternoonA	Building 8 Room 201
Advanced Methods for Identification and Control of Damage in Marine Materials and Structures (Invited Session)	

Chair: Xu Yunze	Dalian University of Technology
Co-Chair: We Zhenhua	Southern University of Science and Technology
Co-Chair: Yuan Yuchao	Shanghai Jiao Tong University
Organizer: We Zhenhua	Southern University of Science and Technology
Organizer: Li Xiaofan	The University of Hong Kong
Organizer: Xu Yunze	Dalian University of Technology

13:30-13:48	TueEarly-AfternoonA.1

Study on the Influence Mechanism of Different Acetic Acid Concentrations on Top-Of-Line Corrosion (I), pp. 1-6

Hou Yucen	Dalian University of Technology
Zhang Qiang	China Nuclear Power Operation Technology Corporation
Gao Luyang	China Nuclear Power Operation Technology Corporation
Li Fuxing	CNOOC China Ltd. Hainan Branch
Wang Mingyu	Dalian University of Technology
Yunze Xu	Dalian University of Technology
Yi Huang	Dalian University of Technology

13:48-14:06	TueEarly-AfternoonA.2

Erosion-Corrosion Coupled Damage Mechanism of Ni-Mn-Cr-Mo Ultra-High Strength Steel in Seawater Solutions of Varying pH Values (I), pp. 1-6

Liang Peinan	Dalian University of Technology
Qiu Hairong	CNOOC China Ltd., Shanghai
Lang Yiming	CNOOC China Ltd., Shanghai
Nie Sijia	Dalian University of Technology
Xu Yunze	Dalian University of Technology
Wang Mingyu	Dalian University of Technology
Huang Yi	Dalian University of Technology

14:06-14:24	TueEarly-AfternoonA.3

Difficulties in Safe Return to Port Design for Offshore Platform and Critical Focus Area in Marine Engineering System (I), pp. 1-5

Wu Lei	Marine Design & Research Institute of China
Li Renke	Marine Design & Research Institute of China
Zheng Zhuo	Marine Design & Research Institute of China
Huang Ji	Marine Design&research Institute of China
Zhou Puyu	Marine Design & Research Institute of China

14:24-14:42	TueEarly-AfternoonA.4

Deep Learning-Based Structural Health Monitoring Using Vibration Signals under Sensor Fault Conditions (I), pp. 1-6

Zhang Lite	Southern University of Science and Technology
Lu Yiwen	Ship Development and Design Center

CAMS 2025

16th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles, 2025
第十六届国际自动控制联合会海洋系统、机器人技术及载运工具控制应用会议

| Tao Peng | Ship Development and Design Center |
| Wei Zhenhua | Southern University of Science and Technology |

| **14:42-15:00** | **TueEarly-AfternoonA.5** |

Performance Evaluation of Volatile Corrosion Inhibitors under Irradiation Via Molecular Dynamics Simulations (I), pp. 1-6

Xu Qingqing	Southern University of Science and Technology
Zhang Yikun	Southern University of Science and Technology
Liu Han	Sichuan University
Wei Zhenhua	Southern University of Science and Technology

| **15:00-15:18** | **TueEarly-AfternoonA.6** |

Multi-Level Strategy for Stress Identification and Safety Assessment of Offshore Platform Structures (I), pp. 1-6

Su Xin	Dalian University of Technology
Ren Mengyao	Dalian University of Technology
Zhang Qi	The National Natural Science Foundation of China

| **TueEarly-AfternoonB** | **Building 8 Room 302** |
| **Development and Application of Intervention-Autonomous Underwater Vehicles in Ocean Engineering (Part I) (Invited Session)** | |

Chair: Sanz P.J.	Univ of Jaume I
Co-Chair: Huang Hai	Harbin Engineering University
Co-Chair: Zhang Tiedong	Sun Yat-Sun University
Organizer: Huang Hai	Harbin Engineering University
Organizer: Yang Shaolong	Huazhong University of Science and Technology
Organizer: Wang Zhuo	Harbin Engineering University
Organizer: Zuo Yi	Dalian Maritime University

| **13:30-13:48** | **TueEarly-AfternoonB.1** |

Gaussian Process-Based Hierarchical Model Predictive Control for Underactuated AUV with Plant-Model Mismatch (I), pp. 1-6

Hu Kaiyang	Huazhong University of Science and Technology
Wan Yiming	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology
Xiang Gong	Huazhong University of Science and Technology
Xiang Xianbo	Huazhong University of Science and Technology

| **13:48-14:06** | **TueEarly-AfternoonB.2** |

Ship Trajectory Modelling and Prediction Based on Sequence-To-Sequence Framework (I), pp. 1-6

Zhao Yuanhe	Dalian Maritime University
Zuo Yi	Dalian Maritime University
Zhao Licheng	Dalian Maritime University

| **14:06-14:24** | **TueEarly-AfternoonB.3** |

Preliminary Design of a Deformable Quadruped Underwater Robot for Deep-Sea Benthic Operation (I), pp. 1-5

Wu Dingyi	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology
Cuan Xinwei	School of Naval Architecture and Ocean Engineering, Huazhong Uni

| Zheng Jinrong | Huazhong University of Science and Technology |
| Wang Yan | Huazhong University of Science and Technology |

| **14:24-14:42** | **TueEarly-AfternoonB.4** |

Preliminary Design of an Intervention-Morphable Underwater Robot Featuring Low-Drag Transit and Stable Hovering Manipulation (I), pp. 1-5

Zhang Yun Fei	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology
Wu Dingyi	Huazhong University of Science and Technology
Zheng Jinrong	Huazhong University of Science and Technology
Wang Yan	Huazhong University of Science and Technology

| **14:42-15:00** | **TueEarly-AfternoonB.5** |

OLFNet-UW: Optical-LiDAR Fusion Networks for Underwater Semantic Segmentation (I), pp. 1-6

Ou Zhixin	Harbin Enginnering University
Hu Jingwei	Harbin Engineering University
Huang Hai	Harbin Engineering University
Han Xinyue	Harbin Engineering University
Qin Hongde	Harbin Engineering University

| **15:00-15:18** | **TueEarly-AfternoonB.6** |

Modeling and Dynamic Analysis of an Underactuated AUV with a Long Towed Array (I), pp. 1-6

Lu Guanyu	Sun Yat-Sun University
Zhang Tiedong	Sun Yat-Sun University
Lei Ming	Sun Yat-Sen University
Yan Xun	Sun Yat-Sun University
Huang Yijing	Sun Yat-Sun University

TueEarly-AfternoonC	**Building 1 Room 312**
Sensing, Modeling and Control of Unmanned Underwater Vehicles (Part I) (Invited Session)	
Chair: Yu Caoyang	Shanghai Jiao Tong University
Co-Chair: Cafaro Adolfo Damiano	Technical University of Denmark
Co-Chair: Chen Qi	University of Shanghai for Science and Technology
Organizer: Cui Rongxin	Northwestern Polytechnical University
Organizer: Yu Caoyang	Shanghai Jiao Tong University
Organizer: Chu Zhenzhong	University of Shanghai for Science and Technology
Organizer: Zhang Zhuo	Northwestern Polytechnical University
Organizer: Rout Raja	Thapar Institute of Engineering and Technology

| **13:30-13:48** | **TueEarly-AfternoonC.1** |

Nonlinear Sliding Mode Based Cooperative Guidance for AUVs with Multiple Constraints (I), pp. 1-6

Ma Feiyu	Northwestern Polytechnical University
Pan Feng	Jiangsu Automation Research Institute
Xu Hui	Northwestern Polytechnical University
Guo Xinxin	Northwestern Polytechnical University

| Yan Weisheng | Northwestern Polytechnical University |
| Cui Rongxin | Northwestern Polytechnical University |

| **13:48-14:06** | **TueEarly-AfternoonC.2** |

The Impact of Difference Scheme and Sampling Interval on Multicollinearity in Parameter Identification of Unmanned Marine Vehicles (I), pp. 1-6

Li Zheng	Shanghai Jiao Tong University
Yu Caoyang	Shanghai Jiao Tong University
Xiang Xianbo	Huazhong University of Science and Technology
Lian Lian	Shanghai Jiao Tong University

| **14:06-14:24** | **TueEarly-AfternoonC.3** |

Integrated Thrust Allocation and Learning-Enhanced MPC for ROV Control under Model Uncertainties (I), pp. 1-6

Shen Xuyu	University of Shanghai for Science and Technology
Chu Zhenzhong	University of Shanghai for Science and Technology
Hu XuanYu	University of Shanghai for Science and Technology

| **14:24-14:42** | **TueEarly-AfternoonC.4** |

Finite-Time LOS-Based Guidance Design for Depth-Tracking Control of Underactuated AUVs (I), pp. 1-6

Wan Gang	Hubei Technology Innovation Center for Smart Hydropower
Zhu Sisi	Hubei Technology Innovation Center for Smart Hydropower
Li Xinyu	China Yangtze Power Co., Ltd.Harbin Engineering University
Qu Yang	Huazhong University of Science and Technology
Xiang Xianbo	Huazhong University of Science and Technology

| **14:42-15:00** | **TueEarly-AfternoonC.5** |

Energy-Optimized Dynamic Light-Of-Sight Guidance Method for AUV Path Following (I), pp. 1-6

Li Zhengyang	Harbin Engineering University
Liu Xing	Harbin Engineering University
Wang Tong	Harbin Engineering University
Geng Bo	Harbin Engineering University

| **15:00-15:18** | **TueEarly-AfternoonC.6** |

Experimental Verification of an Encrypted Path Following Controller for an ROV (I), pp. 1-6

Cafaro Adolfo Damiano	Technical University of Denmark
Louedec Morgan	ENSTA Bretagne
Scaradozzi David	Università Politecnica Delle Marche
Galeazzi Roberto	Technical University of Denmark

TueEarly-AfternoonD	Building 1 Room 211
Planning and Control of Marine Vehicles (Part I) (Invited Session)	

Chair: Ning Jun	Dalian Maritime University
Co-Chair: Ermolaev Artem	ITMO University
Co-Chair: Gu Nan	Shanghai Maritime University
Organizer: Peng Zhouhua	Dalian Maritime University
Organizer: Ning Jun	Dalian Maritime University
Organizer: Wang Anqing	City University of Hong Kong
Organizer: Gu Nan	Dalian Maritime University

13:30-13:48	TueEarly-AfternoonD.1

Fixed-Time Disturbance Observer Based Trajectory Tracking Control of Unmanned Surface Vehicle with Input Quantization and Output Constraints (I), pp. 1-6

Yue Yuanning	Dalian Maritime University
Li Wei	Dalian Maritime University
Ning Jun	Dalian Maritime University

13:48-14:06	TueEarly-AfternoonD.2

Adaptive Neural Network Course Tracking Control of USV with Time-Varying Output Constraints and Input Quantization (I), pp. 1-6

Yue Xingwang	Dalian Maritime University
Jin Liangtao	Dalian Maritime University
Ning Jun	Dalian Maritime University

14:06-14:24	TueEarly-AfternoonD.3

Motion Control of a Non-Holonomic Marine Robot for Seeking and Tracking an Isoline of an Unknown Environmental Field (I), pp. 1-6

Ermolaev Artem	ITMO University
Popov Arseniy	ITMO University
Kapitonov Aleksandr	New Uzbekistan University
Matveev Alexey S.	St.Petersburg University

14:24-14:42	TueEarly-AfternoonD.4

Predictive-Based Trajectory Tracking Control of a Fully-Actuated Unmanned Surface Vehicle Via Physics-Informed Neural Network (I), pp. 1-6

Peng Zhouhua	Dalian Maritime University
Wei Zixiang	Dalian Maritime University
Liu Lu	Dalian Maritime University
Bing Han	Shanghai Ship and Shipping Research Institute
Wang Dan	Dalian Maritime University
Gu Nan	Dalian Maritime University

14:42-15:00	TueEarly-AfternoonD.5

Automatic Ship Collision Avoidance Decision-Making Method Via Improved PPO Algorithm (I), pp. 1-6

Hao Shuhui	Dalian Maritime University
Guan Wei	Dalian Maritime University
Cui Zhewen	Dalian Maritime University

| Qu Sheng | Dalian Maritime University |
| Hu Tongbo | Dalian Maritime University |

| **15:00-15:18** | **TueEarly-AfternoonD.6** |

Path Planning of Unmanned Surface Vehicle Based on Improved A Algorithm (I), pp. 1-6*

Wu Chengzhi	Shanghai Maritime University
Hou Xianrui	Shanghai Maritime University
Xie Lixin	Shanghai Merchant Ship Design and Research Institute
Zhang Qixin	Shanghai Merchant Ship Design and Research Institute

| **TueEarly-AfternoonE** | **Building 1 Room 212** |
| **Novel Intelligent Sensors and Approaches for Marine Robotics Localization and Mapping (Invited Session)** | |

Chair: Arshad Mohd Rizal	Universiti Sains Malaysia
Co-Chair: Wang Ning	Dalian Maritime University
Co-Chair: Zhang Jialei	Huazhong University of Science and Technology
Organizer: Arshad Mohd Rizal	Universiti Sains Malaysia

| **13:30-13:48** | **TueEarly-AfternoonE.1** |

Towards Multi-Domain SLAM in GNSS Denied, Maritime Urban Environments (I), pp. 1-6

Lund Aimas	Technical University of Denmark
Hansen Peter Nicholas	Technical University of Denmark
Thompson Fletcher	Technical University of Denmark
Prabowo Yaqub Aris	Technical University of Denmark
Galeazzi Roberto	Technical University of Denmark

| **13:48-14:06** | **TueEarly-AfternoonE.2** |

Low Visibility Enhancement for Intelligent Marine Vehicles in Hazy Environments (I), pp. 1-6

Fan Shumin	Dalian Maritime University
Wang Ning	Dalian Maritime University
Song Tianyu	Dalian Maritime University

| **14:06-14:24** | **TueEarly-AfternoonE.3** |

Adaptive DiffTune MPC for Marine Robots: An OceanSim-Based Study (I), pp. 1-5

Ismail Zool Hilmi	Universiti Teknologi Malaysia
Casas Gianmarco Goycochea	Federal University of Viçosa
Arshad Mohd Rizal	Universiti Sains Malaysia

| **14:24-14:42** | **TueEarly-AfternoonE.4** |

Visual Servo Tracking Control of UUV with a Linear Velocity Estimation Strategy (I), pp. 1-6

Zhang Lidong	University of Shanghai for Science and Technology
Huang Yao	University of Shanghai for Science and Technology
Wei Xuhong	Marine Design and Research Institute of China
Chu Zhenzhong	University of Shanghai for Science and Technology

| **14:42-15:00** | **TueEarly-AfternoonE.5** |

SLAM for Autonomous Docking: A Case Study in Copenhagen's Harbour Buses (I), pp. 1-6

| Aggerholm Oda Byskov | DTU |

Prabowo Yaqub Aris	Technical University of Denmark
Hansen Peter Nicholas	Technical University of Denmark
Galeazzi Roberto	Technical University of Denmark

15:00-15:18   TueEarly-AfternoonE.6

Research on Multi-Sensor Data Fusion-Based Localization of Underwater Robots in Confined Spaces (I), pp. 1-6

Wang Gaoxian	Dalian Maritime University
Chen Yinglong	Dalian Maritime University
Wu Haoyu	Dalian Maritime University
Yan Bo	Dalian Maritime University

TueEarly-AfternoonF   Building 1 Room 311

Path-Following and Trajectory Tracking: From Classical Control Methodologies to Artificial Intelligence-Based Approaches (Part I) (Invited Session)

Chair: Bibuli Marco	CNR-INM
Co-Chair: Nad Dula	University of Zagreb
Co-Chair: Liu Yifan	Huazhong University of Science and Technology
Organizer: Bibuli Marco	CNR-INM
Organizer: Zereik Enrica	CNR-INM

13:30-13:48   TueEarly-AfternoonF.1

Disturbance Compensation for a 3D Virtual-Target Based Path-Following Guidance System (I), pp. 1-6

| Bibuli Marco | CNR-INM |

13:48-14:06   TueEarly-AfternoonF.2

Tunable Predefined-Time Path Following Control of Marine Vehicles with Event-Triggered Input (I), pp. 1-6

Guo Ying	Shanghai Jiao Tong University
Yu Caoyang	Shanghai Jiao Tong University
Xiang Xianbo	Huazhong University of Science and Technology
Lian Lian	Shanghai Jiao Tong University

14:06-14:24   TueEarly-AfternoonF.3

Oscillation-Suppressing LOS-Based Guidance for Curved Path Following Control of Underactuated USVs (I), pp. 1-6

Nie Changxing	Huazhong University of Science and Technology
Nie Hua	China Ship Development and Design Center
Pan Chenyang	China Ship Development and Design Center
Sun Hongbo	China Ship Development and Design Center
Wan Gang	Hubei Technology Innovation Center for Smart Hydropower
Zhu Sisi	Hubei Technology Innovation Center for Smart Hydropower
Li Xinyu	China Yangtze Power Co., Ltd., Harbin Engineering University
Qu Yang	Huazhong University of Science and Technology

14:24-14:42   TueEarly-AfternoonF.4

System Architecture and Implementation of a Path-Planning Module for Autonomous Vessels (I), pp. 1-6

| Krizman Enio | Norwegian University of Science and Technology |
| Kapetanovic Nadir | University of Zagreb |

Nad Dula	University of Zagreb

Trajectory Tracking Control of Unmanned Surface Vehicles Using Adaptive Lyapunov-Based Model Predictive Control (I), pp. 1-6

Xie An	Hainan University
Zhang Chen	Hainan University
Zhang Weidong	Shanghai Jiaotong University
Jia Zehua	Hainan University, Shanghai Jiao Tong University

15:00-15:18	**TueEarly-AfternoonF.6**

Underwater Cooperative Target Tracking Algorithm Based on Passive Features and Planning Information (I), pp. 1-6

You Zhuo	Wuhan Second Ship Design and Research Institute
Wang Jia	Wuhan Second Ship Design and Research Institute
Fu Shaobo	Wuhan Second Ship Design and Research Institute
Guan Xiawei	Wuhan Second Ship Design and Research Institute
Zhang Hao	Wuhan Second Ship Design and Research Institute

TueEarly-AfternoonG	**Building 1 International Exchange Office Meeting Room 112**
Energy and Actuation Systems (Regular Session)	

Chair: Chu Zhenzhong	University of Shanghai for Science and Technology
Co-Chair: Wang Andong	Huazhong University of Science and Technology
Co-Chair: Jiajia Liu	Zhejiang University

13:30-13:48	**TueEarly-AfternoonG.1**

Design and Evaluation of Marine Main Engine Control System Based on Direct Search Technique Using Inverse Quadratic Interpolation, pp. 1-6

Mizuno Naoki	Nagoya Institute of Technology
Tsuji Takuya	Nagoya Institute of Technology

13:48-14:06	**TueEarly-AfternoonG.2**

Autonomous Gait Switching Strategy for Cross Domain Robots Based on Bayesian Networks, pp. 1-6

Wang Yue	Anhui University
Li Haoxiang	Anhui University
Xu Yalin	Anhui University
Li Huaxiang	AnHui University
Cao Xiang	Anhui University

14:06-14:24	**TueEarly-AfternoonG.3**

Motion Control of Underwater Electro-Hydrostatic Actuators Based on Co-Simulation Platform, pp. 1-6

Yang Chaokun	Zhejiang University
Jiajia Liu	Zhejiang University
Su Weihong	Zhejiang University
Wu Xinran	Hangzhou Haiyineng Mechatronic Technology Co., Ltd
Nie Yong	Zhejiang University
Chen Zheng	Zhejiang University

Mei Deqing	The State Key Laboratory of Fluid Power Transmission and Control

14:24-14:42	**TueEarly-AfternoonG.4**

Application of Speed Prediction Based on Gaussian Process Regression to the Airfoil Sail VLCC, pp. 1-6

Liu Zeping	Dalian Maritime University
Huo Ziteng	Dalian Maritime University
Gao Yufu	Dalian Maritime University
Guo Yi	Dalian Maritime University
Wang Shenghai	Dalian Maritime University
Han Guangdong	Dalian Maritime University

14:42-15:00	**TueEarly-AfternoonG.5**

Energy Efficient Control of Electric Driven Vessels Including Current Effects, pp. 1-6

Jonitz Pia-Lucia	Karlsruhe Institute of Technology
Meurer Thomas	Karlsruhe Institute of Technology

15:00-15:18	**TueEarly-AfternoonG.6**

Combining Moving Mass Actuators and Manoeuvring Models for Underwater Vehicles: A Lagrangian Approach, pp. 1-5

Rambech Alexander Brevad	Oslo Metropolitan University
Saksvik Ivar	Oslo Metropolitan University
Hassani Vahid	Oslo Metropolitan University

TueAfternoonA	**Building 8 Room 201**
Environmental Monitoring & Data Acquisition (Regular Session)	

Chair: Zhang Qi	Dalian University of Technology
Co-Chair: Zhou Yanmin	Tongji University
Co-Chair: Li Xinyu	China Yangtze Power Co., Ltd.

15:38-15:56	**TueAfternoonA.1**

Design and Development of a Boat-Mountable Sensor Rack for Maritime Perception and Data Acquisition, pp. 1-6

Obradovic Juraj	FER, University of Zagreb
Fabijanic Matej	Faculty of Electrical Engineering and Computing Zagreb
Lovrić Josip	University of Zagreb
Kapetanovic Nadir	University of Zagreb
Ferreira Fausto	University of Zagreb
Miskovic Nikola	University of Zagreb
Nad Dula	University of Zagreb

15:56-16:14	**TueAfternoonA.2**

Time Series Modeling of Riser Vibration Modes Using KAN-GRU Algorithm, pp. 1-6

Wang Shang	China Offshore Fugro Geosolutions (Shenzhen) Co., Ltd.
Zheng Miaozi	Tsinghua University
Zhao Yitong	Beijing Institute of Technology
Liu Jinhong	Naval Research Academy
Yan Zhenguo	Naval Research Academy

Fu Ke	Tsinghua Shenzhen International Graduate School

16:14-16:32	**TueAfternoonA.3**

Design and Implementation of a Multimodal Perception Intelligent Skin for Amphibious Autonomous Vehicles, pp. 1-6

Lei Bin	Tongji University
Luo Yijie	Tongji University
Wang Wei	Tongji University
Siyuan He	Ulink College of Shanghai
Wang Zhipeng	Tongji University
Cheng Bin	Tongji University
Zhou Yanmin	Tongji University
He Bin	Tongji University

16:32-16:50	**TueAfternoonA.4**

Application Research of Cascade Hydropower Station Maintenance Based on Unmanned Underwater Robot Technology, pp. 1-5

Li Xinyu	China Yangtze Power Co., Ltd., Harbin Engineering University
Zhu Sisi	Hubei Technology Innovation Center for Smart Hydropower

16:50-17:08	**TueAfternoonA.5**

A Multi-Output Regression-Based Method for Predicting Structural Responses of Deepwater Jacket Platforms (I), pp. 1-6

Ren Mengyao	Dalian University of Technology
Feng Zhongyuan	Dalian University of Technology
Zhang Qi	The National Natural Science Foundation of China

TueAfternoonB	**Building 8 Room 302**
Development and Application of Intervention-Autonomous Underwater Vehicles in Ocean Engineering (Part II) (Invited Session)	

Chair: Wang Zhuo	Harbin Engineering University
Co-Chair: Zuo Yi	Dalian Maritime University
Co-Chair: Yang Shaolong	Huazhong University of Science and Technology
Organizer: Huang Hai	Harbin Engineering University
Organizer: Yang Shaolong	Huazhong University of Science and Technology
Organizer: Wang Zhuo	Harbin Engineering University
Organizer: Zuo Yi	Dalian Maritime University

15:38-15:56	**TueAfternoonB.1**

Human Occupied Vehicle-Carried Observation-Class Deep-Sea Lightweight Underwater Vehicle: Design and Verification (I), pp. 1-6

Zheng Jinrong	Huazhong University of Science and Technology
Zhang Jialei	Huazhong University of Science and Technology
Yifan Liu	Huazhong University of Science and Technology

15:56-16:14	**TueAfternoonB.2**

Numerical Simulation of Fluid Performance Comparison of Different Types of Underwater Mother Ships (I), pp. 1-6

Hu Xiang	Jiangsu University of Science and Technology

Zhu Yazhou	Jiangsu University of Science and Technology
Li Ningyu	Jiangsu University of Science and Technology
Yanmin Guan	Jiangsu University of Science and Technology
Zhang Baowen	Jiangsu University of Science and Technology

| 16:14-16:32 | TueAfternoonB.3 |

Finite Element Analysis of Longitudinal-Bending Coupled Underwater Acoustic Transducer for AUV Applications (I), pp. 1-6

Gu Xue	Jiangsu University of Science and Technology
Zhu Yazhou	Jiangsu University of Science and Technology
Wang Sha	Jiangsu University of Science and Technology
Yanmin Guan	Jiangsu University of Science and Technology
Li Ningyu	Jiangsu University of Science and Technology
Xue Kaihang	Jiangsu University of Science and Technology

| 16:32-16:50 | TueAfternoonB.4 |

Construction of Motion Planning and Control System for UVMS Manipulator Based on MoveIt (I), pp. 1-6

Zhu Chao	Northwestern Polytechnical University
Kong Deda	Northwestern Polytechnical University
Zhang Shouxu	Northwestern Polytechnical University
Zhao Yang	Northwestern Polytechnical University
Liu Xiaoxu	Northwestern Polytechnical University

| 16:50-17:08 | TueAfternoonB.5 |

A Motion Planning Scheme for UVMS with Multi-State Constraints Based on Dynamics Neural Networks Solver (I), pp. 1-6

| Cheng Jitao | Harbin Engineering University |
| Wei Yanhui | Harbin Engineering University |

| 17:08-17:26 | TueAfternoonB.6 |

Adaptive Multi-Parameter Perturbation Control Strategy for Communication-Free Underwater Magnetically Coupled Wireless Power Transfer Systems Based on Front-End Monitoring and Control (I), pp. 1-6

Wu Huan	Harbin Engineering Univeristy
Zeng Xuemei	Harbin Engineering University
Zhang Xuexin	Chaoyang Engineering and Technical School
Huang Hai	Harbin Engineering University
Luo Bo	Harbin Engineering University

TueAfternoonC	Building 1 Room 312
Sensing, Modeling and Control of Unmanned Underwater Vehicles (Part II) (Invited Session)	
Chair: Tang Guoyuan	Huazhong University of Science and Technology
Co-Chair: Qiao Lei	Shanghai Jiao Tong University
Co-Chair: Jia Zehua	Hainan University
Organizer: Cui Rongxin	Northwestern Polytechnical University
Organizer: Yu Caoyang	Shanghai Jiao Tong University
Organizer: Chu Zhenzhong	University of Shanghai for Science and Technology

Organizer: Zhang Zhuo	Northwestern Polytechnical University
Organizer: Rout Raja	Thapar Institute of Engineering and Technology

15:38-15:56	TueAfternoonC.1

Underactuated Unmanned Underwater Vehicle Speed Adaptive Cooperative Allocation Control (I), pp. 1-5

Cuan Xinwei	Huazhong University of Science and Technology
Wang Andong	Huazhong University of Science and Technology
Guo Heng	Huazhong University of Science and Technology
Hu Yu Hao	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology
Wan Gang	Hubei Technology Innovation Center for Smart Hydropower
Li Xinyu	China Yangtze Power Co., Ltd. Harbin Engineering University

15:56-16:14	TueAfternoonC.2

Multi-Objective Optimization of High-Efficiency Pipeline Cutting Robots for Inland Water Systems (I), pp. 1-6

Qiao Jianan	Shenyang Institute of Automation, Chinese Academy of Sciences
Zhang Wei	Northeastern University
Wang Di	Shenyang Institute of Automation Chinese Academy of Sciences
Wang Zhenyu	Shenyang Institute of Automation Chinese Academy of Sciences
Xie Hualong	Northeastern University
Huang Yan	Shenyang Institute of Automation, Chinese Academy of Sciences
Zhao Baode	Shenyang Institute of Automation Chinese Academy of Sciences

16:14-16:32	TueAfternoonC.3

Adaptive Predefined-Performance Sliding Mode Control with Application to Autonomous Underwater Vehicles (I), pp. 1-6

Chen Hongxuan	Huazhong University of Science and Technology
Ye Zhenxia	Huazhong University of Science and Technology
Zhou Xiaoyu	Huazhong University of Science and Technology
Wang Shufeng	Huazhong University of Science and Technology
Xiao Wenqiang	Huazhong University of Science and Technology
Tang Guoyuan	Huazhong University of Science and Technology

16:32-16:50	TueAfternoonC.4

Underwater Monocular Depth Estimation Combined with Physical Prior Information (I), pp. 1-6

Jiang Chaicheng	School of Artificial Intelligence and Automation, Huazhong Unive
Zhen Haoran	Huazhong University of Science and Technology
Wan Gang	Hubei Technology Innovation Center for Smart Hydropower
Zhu Sisi	Hubei Technology Innovation Center for Smart Hydropower
Li Xinyu	China Yangtze Power Co., Ltd., Harbin Engineering University
Xiang Xianbo	Huazhong University of Science and Technology

16:50-17:08	TueAfternoonC.5

Sim2Real Transfer for AUV Games Via MADRL and Digital Twins (I), pp. 1-6

Gan Wenhao	Shanghai Jiao Tong University
Guo Kai	Shanghai Jiao Tong University
Qiao Lei	Shanghai Jiao Tong University

TueAfternoonD	Building 1 Room 211
Planning and Control of Marine Vehicles (Part II) (Invited Session)	

Chair: Karimi Hamid Reza	Politecnico Di Milano
Co-Chair: Shan Qihe	Dalian Maritime University
Co-Chair: Hoischen Nicolas	Technical University Munich
Organizer: Peng Zhouhua	Dalian Maritime University
Organizer: Ning Jun	Dalian Maritime University
Organizer: Wang Anqing	City University of Hong Kong
Organizer: Gu Nan	Dalian Maritime University

15:38-15:56	**TueAfternoonD.1**

Ship Path Planning Based on Monte Carlo Tree Search and Maneuvering Motion Dynamics (I), pp. 1-6

Yang Tianyu	Shanghai Jiao Tong University
Zou Lu	Shanghai Jiao Tong University
Zou Zaojian	Shanghai Jiao Tong University

15:56-16:14	**TueAfternoonD.2**

Risk-Aware Trajectory Optimization and Control for an Underwater Suspended Robotic System (I), pp. 1-6

Origane Yuki	Tokyo Institute of Technology
Hoischen Nicolas	Technical University Munich
Huang Tzu-Yuan	Technical University of Munich(TUM)
Kurabayashi Daisuke	Tokyo Institute of Technology
Sosnowski Stefan	Technical University of Munich (TUM)
Hirche Sandra	Technical University of Munich

16:14-16:32	**TueAfternoonD.3**

Improved Deep Q-Network Coverage Path Planning for USV Maritime Search (I), pp. 1-5

Li Yang	Dalian Maritime University
Shan Qihe	Dalian Maritime University
Ye Peiyun	Dalian Maritime University
Teng Fei	Marine Electrical Engineering Dalian Maritime University
Li Tieshan	University of Electronic Science and Technology of China

16:32-16:50	**TueAfternoonD.4**

Good Seamanship Online Trajectory Planner for Autonomous Ship (I), pp. 1-6

Prabowo Yaqub Aris	Technical University of Denmark
Hansen Peter Nicholas	Technical University of Denmark
Jensen Jens Brauchli	Svendborg International Maritime Academy
Papageorgiou Dimitrios	Technical University of Denmark
Galeazzi Roberto	Technical University of Denmark

16:50-17:08	**TueAfternoonD.5**

Research on AUV Trajectory Planning in Complex Ocean Current Environments (I), pp. 1-5

Hu Zijian	Shanghai Maritime University
Gan Wenyang	Shanghai Maritime University
Cai Caixia	Shanghai Maritime University

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16th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles, 2025
第十六届国际自动控制联合会海洋系统、机器人技术及载运工具控制应用会议

TueAfternoonE	Building 1 Room 212
Marine Vehicle Docking (Regular Session)	

Chair: Wang Haibin	Harbin University of Science and Technology
Co-Chair: Liu Zhi	Hubei University of Technology
Co-Chair: Zhu Yazhou	Jiangsu University of Science and Technology

15:38-15:56	**TueAfternoonE.1**

Experimental Evaluation of Fiducial Marker Based Localization Method for ROV Docking, pp. 1-6

Gülland Martin	University of Rostock
Kurowski Martin	University of Rostock
Jeinsch Torsten	University of Rostock

15:56-16:14	**TueAfternoonE.2**

Deep Reinforcement Learning-Based Decision-Making for Autonomous Docking of Underwater Vehicles, pp. 1-6

Ran Qili	Northwestern Polytechnical University
Gao Jian	Northwestern Polytechnical University

16:14-16:32	**TueAfternoonE.3**

Non-Cooperative Game Theoretic Optimization for Real-Time Docking Control of Multiple Unmanned Surface Vehicles, pp. 1-5

Wang Haibin	Harbin University of Science and Technology
Li Yamei	Harbin University of Science and Technology
Zhang Jingyan	Harbin University of Science and Technology
Guo Yabo	The 60th Research Institute of China RongTong Asset Management Group Corporation Limited

16:32-16:50	**TueAfternoonE.4**

Hierarchical Planning and Control for Underwater Dynamic Docking Based on Model Predictive Optimization, pp. 1-6

Liu Zhi	Hubei University of Technology
Zhao Zijie	Hubei University of Technology
Liao Hongjun	Hubei University of Technology

16:50-17:08	**TueAfternoonE.5**

Underwater Acoustic Targets Tracking Method for Autonomous Docking of AUVs (I), pp. 1-6

Liu Dianwei	Huazhong University of Science and Technology
Zuo Mingjiu	Naval University of Engineering
Jiang Chaicheng	Huazhong University of Science and Technology

TueAfternoonF	Building 1 Room 311
Path-Following and Trajectory Tracking: From Classical Control Methodologies to Artificial Intelligence-Based Approaches (Part II) (Invited Session)	

Chair: MacLin Gage	University of Iowa
Co-Chair: Bibuli Marco	CNR-INM
Co-Chair: Qin Yuanqing	Huazhong University of Science and Technology
Organizer: Bibuli Marco	CNR-INM
Organizer: Zereik Enrica	CNR-INM

15:38-15:56	**TueAfternoonF.1**

Neural Network Control-Based Simulation of USV Motion Control (I), pp. 1-6

Zhao Qiaosheng	China Ship Scientific Research Center
Ren Mengchen	China Ship Scientific Research Center

15:56-16:14 **TueAfternoonF.2**

Virtual Target Based Path-Following: Integration with Conventional NGC Architectures and Performance Evaluation (I), pp. 1-6

Caccia Massimo	CNR-INM
Bibuli Marco	CNR-INM

16:14-16:32 **TueAfternoonF.3**

RMPC-Based 3D Trajectory Tracking for Unmanned Underwater Vehicles in Complex Ocean Environments (I), pp. 1-6

Qiao Panpan	Huazhong University of Science and Technology
Dong Jialin	Huazhong University of Science and Technology
Chen Linyuan	Huazhong University of Science and Technology
Xu Guohua	Huazhong University of Science and Technology
Yang Zhiqiang	Huazhong University of Science and Technology

16:32-16:50 **TueAfternoonF.4**

Path Following Control for AUV with Variable Buoyancy Systems under Complex Disturbances (I), pp. 1-6

Huang Renjie	Huazhong University of Science and Technology
Qin Yuanqing	Huazhong University of Science and Technology
Yang Zhiqiang	Huazhong University of Science and Technology
Xu Guohua	Huazhong University of Science and Technology
Wu Chen	Huazhong University of Science and Technology

16:50-17:08 **TueAfternoonF.5**

Adaptive Reference Management and Model Predictive Control for Near-Surface Operations of Autonomous Underwater Vehicles (I), pp. 1-6

Hammond Maxwell	University of Iowa
MacLin Gage	University of Iowa
Cichella Venanzio	University of Iowa

TueAfternoonG **Building 1 International Exchange Office Meeting Room 112**

Application of Triboelectric Nanogenerator in Ocean Energy and Ocean Engineering (Invited Session)

Chair: Hu Guobiao	The Hong Kong University of Science and Technology (Guangzhou)
Co-Chair: Wu Mengwei	Dalian Maritime University
Co-Chair: Wang Yan	Huazhong University of Science and Technology
Organizer: Zhou Tongming	The University of Western Australia
Organizer: Hu Guobiao	The Hong Kong University of Science and Technology (Guangzhou)
Organizer: Wang Yan	Huazhong University of Science and Technology
Organizer: Xu Minyi	Dalian Maritime University

15:38-15:56 **TueAfternoonG.1**

Inverted Pendulum-Type Triboelectric Nanogenerator for Harvesting Ocean Current Energy in Low Speed Current (I), pp. 1-6

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Zhang Yu	Dalian Maritime University in Dalian, Liaoning Province
Zhuo Zhenhan	Dalian Maritime University
Cui Yunjie	Dalian Maritime University
Wu Bo	Dalian Maritime University
Xi Ziyue	Dalian Maritime University
Wang Hao	Dalian Maritime University

15:56-16:14	TueAfternoonG.2

Design of Electromagnetic and Triboelectric Hybrid Wave Energy Harvesting Device (I), pp. 1-6

Cai Sijie	Huazhong University of Science and Technology
Wu Dingyi	Huazhong University of Science and Technology
Wang Yan	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology
Hu Guobiao	The Hong Kong University of Science and Technology (Guangzhou)

16:14-16:32	TueAfternoonG.3

A Coaxial Triboelectric-Electromagnetic Hybrid Generator for Marine Flow Energy Harvesting (I), pp. 1-6

Wang Yawei	The Hong Kong University of Science and Technology (Guangzhou)
Wang Yan	Huazhong University of Science and Technology
Hu Guobiao	The Hong Kong University of Science and Technology (Guangzhou)

16:32-16:50	TueAfternoonG.4

Hydrodynamic Analysis-Driven Design of a Built-In Triboelectric Nanogenerator for Drifting Buoys (I), pp. 1-6

Zhu Chuanqing	Dalian Maritime University
Yu Chengnuo	Dalian Maritime University
Du Hengxu	Dalian Maritime University
Wu Mengwei	Dalian Maritime University

16:50-17:08	TueAfternoonG.5

A New Actuator with LQR Control Method for an Active Vibration Isolation System (I), pp. 1-6

Su Jiachang	Wuhan University of Science and Technology
Xiao Han	Wuhan University of Science and Technology
Zhang Lei	Wuhan University of Science and Technology

Technical Program for Wednesday August 27, 2025

Chair: Caccia Massimo	CNR-INM
Co-Chair: Dai Tianjiao	Huazhong University of Science and Technology
Co-Chair: Wan Yiming	Huazhong University of Science and Technology

13:30-13:48   **WesEarly-AfternoonA.1**

Fault-Tolerant Model Predictive Control with Reconfigurable Reference for AUV Depth Tracking, pp. 1-6

Hongyu Chen	Huazhong University of Sciense and Technology
Wan Yiming	Huazhong University of Science and Technology

13:48-14:06   **WesEarly-AfternoonA.2**

Fault Detection and Accommodation for Pump-Jet Equipped SWAMP ASV, pp. 1-6

Caccia Massimo	CNR-INM
Odetti Angelo	CNR
Glotzbach Thomas	Technische Hochschule Mittelhessen - University of Applied Sciences
Grieger Thorben	Technische Hochschule Mittelhessen - University of Applied Sciences
Beul Christian	Technische Hochschule Mittelhessen - University of Applied Sciences
Bruzzone Gabriele	CNR-ISSIA

14:06-14:24   **WesEarly-AfternoonA.3**

A Dynamic Extraction of TERCOM Reliability Algorithm for Gravity-Aided Navigation, pp. 1-6

Zou Jiasheng	SOUTHEAST UNIVERCITY
Cai Tijing	SOUTHEAST UNIVERCITY

14:24-14:42   **WesEarly-AfternoonA.4**

Intelligent Fault Diagnosis and Decision Evaluation for Steering System Based on X-Rudder AUV Motion State, pp. 1-6

Xie Sha	Wuhan Second Ship Design and Research Institute
Zhang Yinghao	Wuhan Second Ship Design and Research Institute
Guoao Chen	Wuhan Second Ship Design and Research Institute
Ni, Xiong Xiong	Wuhan Second Ship Design and Research Institute
Liu Xinyu	Wuhan Second Ship Design and Research Institute
Liu Hengling	Wuhan Second Ship Design and Research Institute
Liu Gang	Wuhan Second Ship Design and Research Institute

14:42-15:00   **WesEarly-AfternoonA.5**

A Bayesian Inference-Based Time-Dependent Probabilistic Corrosion Model for Offshore Platforms with Continuous Parameter Updating, pp. 1-6

Feng Zhongyuan	Dalian University of Technology
Su Xin	Dalian University of Technology
Zhang Qi	The National Natural Science Foundation of China

15:00-15:18   **WesEarly-AfternoonA.6**

Fuzzy-Based Adaptive Control for Isothermal Pneumatic Vibration Isolation with Full State Constraints and Voltage Saturation, pp. 1-6

Shi Yan	Beihang University
Wang Yingjian	Beihang University
Xu Shaofeng	Liupanshan Laboratory
Wang Kai	Shaanxi Fast Gear Co., Ltd., Xian
Liu Xiaoxia	Beihang University
Lu Jiaxing	Beihang University
Sun Zhibo	Beihang University
Wang Yixuan	Beihang University

WesEarly-AfternoonB — Building 8 Room 302
Renewable Marine Energy Systems: Modeling, Control, Health Monitoring (Invited Session)

Chair: Liu Zhongchi	University of Lisbon
Co-Chair: Mingyang Xie	Nanjing University of Aeronautics and Astronautics
Co-Chair: Liu Yan	Huazhong University of Science and Technology
Organizer: Karimi Hamid Reza	Politecnico Di Milano

13:30-13:48 — WesEarly-AfternoonB.1

Robust Tracking of Quadrotor Unmanned Aerial Vehicles Based on a Linear Active Disturbance Rejection Framework (I), pp. 1-6

Yang Han	Nanjing University of Aeronautics and Astronautics
Qu Qiang	Nanjing University of Aeronautics and Astronautics
Li Wei	Nanjing University of Aeronautics and Astronautics
Chen Xin	Nanjing University of Aeronautics and Astronautics
Mingyang Xie	Nanjing University of Aeronautics and Astronautics, Nanjing, Chi

13:48-14:06 — WesEarly-AfternoonB.2

Improved DDQN-Based Autonomous Cooperative Control for UAV Formation Maintenance (I), pp. 1-6

Li Wei	Nanjing University of Aeronautics and Astronautics
Chen Xin	Nanjing University of Aeronautics and Astronautics
Sun Jiushun	Nanjing University of Aeronautics and Astronautics
Yang Han	Nanjing University of Aeronautics and Astronautics
Mingyang Xie	Nanjing University of Aeronautics and Astronautics, Nanjing, Chi

14:06-14:24 — WesEarly-AfternoonB.3

Adaptive Wave Energy Converter Excitation Force Predictor in the Support Vector Machine Framework, pp. 1-6

Cavanini Luca	Industrial Systems and Control., Ltd.
Felicetti Riccardo	Università Politecnica Delle Marche
Ferracuti Francesco	Universita' Politecnica Delle Marche
Monteriù Andrea	Università Politecnica Delle Marche

14:24-14:42 — WesEarly-AfternoonB.4

Effects of Control Strategies on the Dynamics of a 15-MW Semi-Submersible Floating Wind Turbine: A Pywind-Based Numerical Study, pp. 1-6

| Pan Tianguo | China General Nuclear Power Corporation（Guang Dong） |
| Bao Xiupeng | China General Nuclear Power Corporation（Guang Dong） |

Huang Shuaifeng	Shanghai Jiao Tong University
Chen Peng	Shanghai Jiao Tong University
Guo Zisheng	China General Nuclear Power Corporation（Guang Dong）
Shui Yidi	Shanghai Jiao Tong University
Shao Wenxi	Shanghai Jiao Tong University
Cheng Zhengshun	Shanghai Jiao Tong University

14:42-15:00	WesEarly-AfternoonB.5

Design and Optimization of Small Offshore Buoys Based on Tuned Mass Damping, pp. 1-6

Ma Dongqing	Zhejiang University
Si Haojie	Zhejiang University
Lin Yuan	Zhejiang University
Chen Jiawang	Zhejiang University

15:00-15:18	WesEarly-AfternoonB.6

High-Fidelity Process Plant Modeling of an Unmanned Sailboat with a Wing Sail Based on Multi-Body Dynamics, pp. 1-6

Peng Bo	Tsinghua University
An Yang	Tsinghua Shenzhen International Graduate School
Zhang Mengwei	Tsinghua University
Ren Zhengru	Tsinghua University

WesEarly-AfternoonC	Building 1 Room 312
Swarm Coordination, Vessel Shape Optimization, and Collaborative Estimation for Marine Vehicles (Part I) (Regular Session)	
Chair: Li Huiping	Northwestern Polytechnical University
Co-Chair: Bi Xiaobo	Huazhong University of Science and Technology
Co-Chair: Huang Chenfeng	Dalian Maritime University

13:30-13:48	WesEarly-AfternoonC.1

A Dynamic Task Allocation Method for Heterogeneous UUVs in Communication-Constrained Environments, pp. 1-6

Shen Qingliang	Northwestern Polytechnical University
Li Huiping	Northwestern Polytechnical University
Yang Dawei	Jiangsu Automation Research Institute
Wang Yu	Northwestern Polytechnical University
Chang Peng	Jiangsu Automation Research Institute
Wang Jiaoyan	Jiangsu Automation Research Institute
Yao Yao	Jiangsu Automation Research Institute

13:48-14:06	WesEarly-AfternoonC.2

Distributed Pursuit Strategy of Multiple USVs in Adversarial Environment, pp. 1-6

Zhang Zhao	Dalian Maritime University
Liang Xiao	Dalian Maritime University
Chen Cong	Dalian Maritime University
Liu Dianyong	Dalian Maritime University
Yu Changdong	Dalian Maritime University

Song Yankong	Dalian Maritime University

14:06-14:24	**WesEarly-AfternoonC.3**

Centralized MAPF-Based Path Planning for Optimal Berth of Multiple USVs in a Marina, pp. 1-6

Kim Siwon	Pukyong National University
Kim Jung Hyeon	Pukyong National University
Kim Dong-Han	Pukyong National University
Im Sunhyuck	Pukyong National University
Jeong Seong-Hyeon	Pukyong National University
Seo Jin-Hyeok	Pukyong National University
Kang Hyo-Eun	Pukyong National University
Kim Yeon-Su	Pukyong National University
Park Jong-Yong	Pukyong National University

14:24-14:42	**WesEarly-AfternoonC.4**

Dynamic Event-Triggered Fuzzy Control for Multi-Ship Towing System with Multiple Obstacles Environment, pp. 1-6

Huang Chenfeng	Dalian Maritime University
Zhao Yi	Dalian Maritime University
Zhang Guoqing	Dalian Maritime University

14:42-15:00	**WesEarly-AfternoonC.5**

Trajectory Tracking and Collision Avoidance for Unmanned Surface Vehicle Swarms Via Model Predictive Control, pp. 1-6

Cheng Zhiqiang	Huazhong University of Science and Technology
Xie Wenhao	Huazhong University of Science and Technology
Li Zihao	Huazhong University of Science and Technology
Ye Zhenxia	Huazhong University of Science and Technology
Tang Guoyuan	Huazhong University of Science and Technology

15:00-15:18	**WesEarly-AfternoonC.6**

Research on Planning and Control Methods for Recovery Task of Unmanned Surface Vehicle Swarms, pp. 1-6

Ye Zhenxia	Huazhong University of Science and Technology
Cheng Zhiqiang	Huazhong University of Science and Technology
Xie Wenhao	Huazhong University of Science and Technology
Yang Yuchen	Huazhong University of Science and Technology
Tang Guoyuan	Huazhong University of Science and Technology

WesEarly-AfternoonD	**Building 1 Room 211**
GNC for Marine Vehicles (Part I) (Regular Session)	

Chair: Zhang Guoqing	Dalian Maritime University
Co-Chair: Liu Jialun	Wuhan University of Technology
Co-Chair: Wang Yuanhui	Harbin Engineering University

13:30-13:48	**WesEarly-AfternoonD.1**

RL-Based Prescribed Performance Path Following Control for USVs with Intervened Triggering Guidance, pp. 1-6

Li Zhihao	Dalian Maritime University

Zhang Guoqing	Dalian Maritime University
Li Jiqiang	Dalian Maritime University
Zhu Xuanzhi	Instituto Superior Técnico, Universidade De Lisboa

13:48-14:06	**WesEarly-AfternoonD.2**

Sliding Mode Control Enhanced by Tanh Function for Work-Class ROVs in Subsea Cable Tracking, pp. 1-6

Yifan Liu	Huazhong University of Science and Technology
Zhang Jialei	Huazhong University of Science and Technology
Xie Tengfei	Huazhong University of Science and Technology
Feng Lingxiao	Huazhong University of Science and Technology

14:06-14:24	**WesEarly-AfternoonD.3**

Observer-Based Funnel Heading Control with Prescribed Settling Time for Ships: Addressing Rudder Dynamics and Saturation, pp. 1-6

Shahnazi Reza	University of Rostock, University of Guilan
Hahn Tobias	University of Rostock
Kurowski Martin	University of Rostock
Jeinsch Torsten	University of Rostock

14:24-14:42	**WesEarly-AfternoonD.4**

Sliding Mode Control of Autonomous Marine Vehicle with Prescribed Convergence Time, pp. 1-6

Guo Zhiyang	Dalian Maritime University
Zhang Jianing	Dalian Maritime University
Zhang Yi	Dalian Maritime University
Zhang Lei	Dalian Maritime University

14:42-15:00	**WesEarly-AfternoonD.5**

Prescribed Performance Trajectory Tracking Control of Underactuated Autonomous Surface Vehicles, pp. 1-6

Sun Shujie	Harbin Engineering University
Wang Yuanhui	Harbin Engineering University
Dai Kaiheng	Harbin Engineering University

15:00-15:18	**WesEarly-AfternoonD.6**

Online Feedback Optimization for Ship Heading Control Based on Sensitivity Estimation, pp. 1-6

Li Shijie	Wuhan University of Technology
Yang Youwei	Wuhan University of Technology
Liu Jialun	Wuhan University of Technology
Chen Weibang	Wuhan University of Technology

WesEarly-AfternoonE	**Building 1 Room 212**
Marine Perception (Part I) (Regular Session)	

Chair: Sun Bing	Shanghai Maritime University
Co-Chair: Jiang Chaicheng	Huazhong University of Science and Technology
Co-Chair: Zhang Gang	Ningbo University

13:30-13:48	**WesEarly-AfternoonE.1**

LiDAR-Based Pose and Extension Estimation of Maritime Vessels, pp. 1-6

Gutwald Enrico — University of Rostock

Karez Ian — University of Rostock

Kolewe Björn — University of Rostock

Jeinsch Torsten — University of Rostock

13:48-14:06   WesEarly-AfternoonE.2

TFUOD: An End to End Underwater Object Detector Based on Transformer Structure, pp. 1-6

Song Shibo — Shanghai Maritime University

Sun Bing — Shanghai Maritime University

Zhang Jiayao — Shanghai Maritime University

Miao Quanli — Shanghai SICAR Vehicle Technology Development Co., Ltd

14:06-14:24   WesEarly-AfternoonE.3

A Simple yet Effective Attention Acquisition Method on Marine Target Detection, pp. 1-6

Guo Lancong — Shanghai Jiao Tong University

Lyv Xiadong — China Shipbuilding Industry Group Co., Ltd

Gao Rui — Shanghai Jiao Tong University

Huang Wei — China Shipbuilding Industry Group Co., Ltd

Xie Wei — Shanghai Jiao Tong University

14:24-14:42   WesEarly-AfternoonE.4

Lightweight Transformer-Based Semantic Segmentation for Efficient Maritime Environmental Perception, pp. 1-6

Li Chenming — Harbin Engineering University

Cai Chengtao — Harbin Engineering University

Kim Jinwhan — KAIST

14:42-15:00   WesEarly-AfternoonE.5

Hierarchical Image Enhancement Based on Intersectional Cortical Model for Extracting Accurate Ship Trajectories, pp. 1-6

Chen Xinqiang — Shanghai Maritime University

Yang Rui — Shanghai Maritime University

Sun Yang — Shanghai Maritime University

Wang Zichuang — Shanghai Ship and Shipping Research Institute

Zhang Han — Shanghai Maritime University

Postolache Octavian — Iscte-Instituto Iniversitario De Lisboa

15:00-15:18   WesEarly-AfternoonE.6

Lightweight Multi-Task Perception for USV Navigation with Adaptive Feature Fusion, pp. 1-6

Zhou Jianhong — Ningbo University

Zhang Gang — Ningbo University

Liu Yifan — Ningbo University

Sun Weiwei — Department of Geography and Spatial Information Technique

Luo Zhiming — Ningbo Flyshark Power Technology Company Limited

Li Zhengyu — Ningbo University

WesEarly-AfternoonF	Building 1 Room 311
Machine Learning for Marine Control (Part I) (Regular Session)	

Chair: Miao Jianming	Sun Yat-Sen University
Co-Chair: Wang Zihao	Shanghai University
Co-Chair: Li Jinjiang	The University of Hong Kong

13:30-13:48	**WesEarly-AfternoonF.1**

UAV-USV Collaborative Decision-Making Method Based on Multi-Agent Reinforcement Learning, pp. 1-6

Cui Zhewen	Dalian Maritime University
Guan Wei	Dalian Maritime University
Qu Sheng	Dalian Maritime University
Hu Tongbo	Dalian Maritime University
Hao Shuhui	Dalian Maritime University
Zhang Xianku	Dalian Maritime University

13:48-14:06	**WesEarly-AfternoonF.2**

Data-Driven Adaptive Pitch Angle Control for Underactuated Autonomous Underwater Vehicles, pp. 1-6

Li Jinjiang	The University of Hong Kong
Liu Tao	The University of Hong Kong

14:06-14:24	**WesEarly-AfternoonF.3**

AEOAS: SAC with Conservative Q-Learning for USV Obstacle Avoidance in Unknown Marine Environments, pp. 1-6

Zhang Zhuxin	Sun Yat-Sen University
Li Zhuohao	Sun Yat-Sen University
Wang Yanyun	Sun Yat-Sen University
Miao Jianming	Sun Yat-Sen University
Xie Xiaozhen	Fiberhome Marine Network Equipment Co., Ltd.

14:24-14:42	**WesEarly-AfternoonF.4**

Residual Reinforcement Learning Integrated PID Control for Robust Path-Following of USVs in Dynamic Environments, pp. 1-6

Zhang Zhuxin	Sun Yat-Sen University
Li Zhuohao	Sun Yat-Sen University
Wang Yanyun	Sun Yat-Sen University
Miao Jianming	Sun Yat-Sen University
Xie Xiaozhen	Fiberhome Marine Network Equipment Co., Ltd.

14:42-15:00	**WesEarly-AfternoonF.5**

Multi-Factor Excitation-Based Data-Driven Approach for Wide-Speed-Range Modeling of Marine Vehicles, pp. 1-6

Xia Aifei	Shanghai University
Wang Zihao	Shanghai University
Wang Aobo	Tsinghua University
Hao Lizhu	China Ship Scientific Research Center

15:00-15:18	**WesEarly-AfternoonF.6**

Controller Parameter Self-Optimizing Using Deep Reinforcement Learning on Hovering Underwater Vehicle, pp. 1-6

Chen Xueying	Ocean University of China

Wang Xiaomin	Shandong University of Science and Technology
Xie Yunfeng	Ocean University of China
Yang Rui	Ocean University of China

Chair: Du Peng	Northwestern Polytechnical University
Co-Chair: Bartels Sönke	Karlsruhe Institute of Technology
Co-Chair: Tu Haiwen	China University of Geosciences

| **13:30-13:48** | **WesEarly-AfternoonG.1** |

Study on the Multi-Degree-Of-Freedom Coupled Hydrodynamic Characteristics of Periodic Maneuvering Motion in High-Speed Vessels, pp. 1-6

Bao Chaoming	Jiangsu University of Science and Technology
Zeng Yao	Jiangsu University of Science and Technology
Guo Fei	Shanghai Merchant Ship Design and Research Institute
Zhang Daiyu	Jiangsu University of Science and Technology

| **13:48-14:06** | **WesEarly-AfternoonG.2** |

Gaussian Process Regression for System Identification of Autonomous Surface Vessels, pp. 1-6

| Bartels Sönke | Karlsruhe Institute of Technology |
| Meurer Thomas | Karlsruhe Institute of Technology |

| **14:06-14:24** | **WesEarly-AfternoonG.3** |

Multiple-Relaxation-Time Boltzmann Method Combined with Multiple Direct-Forcing Immersed Boundary Method on Non-Uniform Grids for Fluid-Structure Interaction, pp. 1-6

| Min Zheng | Huazhong University of Science and Technology |
| Guoxiang Hou | Huazhong University of Science and Technology |

| **14:24-14:42** | **WesEarly-AfternoonG.4** |

Numerical Study on Hydrodynamic Characteristics of Autonomous Remotely Operated Underwater Vehicle in Multiple Working Modes, pp. 1-6

Zhang Mingjun	Huazhong University of Science and Technology
Xiang Gong	Huazhong University of Science and Technology
An Guangshuo	Huazhong University of Science and Technology
Ma Zehui	Huazhong University of Science and Technology
Li Xinyu	China Yangtze Power Co., Ltd. Harbin Engineering University
Xiang Xianbo	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology

| **14:42-15:00** | **WesEarly-AfternoonG.5** |

Effects of Gait Parameters on the Hydrodynamic Performance of a Tapered-Body Underwater Snake-Like Robot, pp. 1-6

Wang Haiyang	China University of Geosciences (Wuhan)
Tu Haiwen	China University of Geosciences (Wuhan)
Li Zhengzhou	China University of Geosciences (Wuhan)
Tang Xiangyu	China University of Geosciences (Wuhan)
Hu Chenzhuo	China University of Geosciences (Wuhan)

15:00-15:18	WesEarly-AfternoonG.6

A Hybrid Agent Model for Wave Force Prediction of Navigational Vehicles under Internal Solitary Wave Action, pp. 1-5

Cheng Lu	Northwestern Polytechnical University
Du Peng	Northwestern Polytechnical University
Chen Chen	Hanjiang National Laboratory
Zhang Miao	Northwestern Polytechnical University
Li Zhuoyue	Northwestern Polytechnical University

WesAfternoonA	Building 8 Room 201
Marine System Reliability: Fault Tolerance, Risk Assessment, and Communication (Part II) (Regular Session)	
Chair: Adetunji Aduragbemi Samuel	Norwegian University of Science and Technology (NTNU)
Co-Chair: Duan Yu	Huazhong University of Science and Technology
Co-Chair: Wei Huang	Huazhong University of Science and Technology

15:38-15:56	WesAfternoonA.1

AIBLF-Based Adaptive Neural Learning Event-Triggered Fault-Tolerant Control for Underwater Teleoperation Systems with Output and Communication Constraints, pp. 1-6

Longnan Li	Harbin Engineering University
Zhang Lanyong	Harbin Engineering University
Yang Chenguang	University of the West of England

15:56-16:14	WesAfternoonA.2

Identifying Ship in Transit Operation Vulnerabilities through Event-Based Adaptive Stress Testing, pp. 1-6

Sitorus Andreas Raja Goklas	NTNU
Rokseth Børge	NTNU

16:14-16:32	WesAfternoonA.3

Safety Assurance for Autonomous Ships Using Contract-Based Design and Simulation-Based Testing, pp. 1-6

Adetunji Aduragbemi Samuel	Norwegian University of Science and Technology (NTNU)
Vasanthan Chanjei	Det Norske Veritas
Glomsrud Jon Arne	DNV AS
Galeazzi Roberto	Technical University of Denmark
Rokseth Børge	NTNU

16:32-16:50	WesAfternoonA.4

Design of an Underwater Visible Light Communication System Based on OFDM, pp. 1-6

Zhou Yapeng	Harbin Institute of Technology(Shenzhen)
Zhang DeSheng	Harbin Institute of Technology(Shenzhen)
Shen WeiCheng	Harbin Institute of Technology(Shenzhen)
Lu YingHao	Harbin Institute of Technology(Shenzhen)
Wang Xin	Harbin Institue of Technology(Shenzhen)

16:50-17:08	WesAfternoonA.5

Extended Time Varying Multi-Cluster Fluctuating Two-Ray Fading Model for Maritime Environment, pp. 1-6

Vié Antoine	Technical University of Denmark
Galeazzi Roberto	Technical University of Denmark

Papageorgiou Dimitrios   Technical University of Denmark

WesAfternoonB	**Building 8 Room 302**
Advanced Design and Maintenance of Offshore Wind Farms (Invited Session)	
Chair: Kang Hooi-Siang	University of Technology Malaysia
Co-Chair: Li He	Liverpool John Moores Unioversity
Co-Chair: Dai Shu	Shanghai Investigation, Design, and Research Institute
Organizer: Wang Shan	Instituto Superior Técnico
Organizer: Kang Hooi-Siang	University of Technology Malaysia
Organizer: Xiang Gong	Huazhong University of Science and Technology
Organizer: Liu Zhongchi	Instituto Superior Técnico, University of Lisbon
Organizer: Li He	Liverpool John Moores Unioversity
Organizer: Dai Shu	Shanghai Investigation, Design, and Research Institute
15:38-15:56	**WesAfternoonB.1**

Availability Assessment of Offshore Wind Turbines with Condition-Based Opportunistic Maintenance Using GSPN (I), pp. 1-6

Jiang Guangjun	Inner Mongolia University of Technology
Chen Yuchao	Inner Mongolia University of Technology
Huang Peng	Jiangxi University of Science and Technology
Yan Rundong	University of Nottingham
Li He	Liverpool John Moores Unioversity
Loughney Sean	Liverpool John Moores University
Yang Zaili	Liverpool John Moores University
Wang Jin	Liverpool John Moores University
15:56-16:14	**WesAfternoonB.2**

Study on the Coupled Dynamic Response of a Novel Floating Stepped Wind Turbine Platform and Mooring System (I), pp. 1-6

Ding Xinhang	Huazhong University of Science and Technology
Wang Haotian	Huazhong University of Science and Technology
Wang Junjie	Huazhong University of Science and Technology
Xiang Gong	Huazhong University of Science and Technology
Xiang Xianbo	Huazhong University of Science and Technology
16:14-16:32	**WesAfternoonB.3**

Resilience-Oriented Optimization of Offshore Wind Farms: A Multi-Objective Framework with a Novel Sustainability Indicator (I), pp. 1-6

Sun Yu	Harbin Engineering University
Yue Peng	Xihua University
Kang Jichuan	Harbin Engineering University
Li Huanhuan	Liverpool John Moores University
Xu Zifei	University of Liverpool
Xiang Gong	Huazhong University of Science and Technology
16:32-16:50	**WesAfternoonB.4**

Digital and Intelligent Transformation of Offshore Wind Energy Operation and Maintenance: Potential Directions for Future Research (I), pp. 1-6

Li Mingxin	The University of Tokyo

16:50-17:08	**WesAfternoonB.5**

Design & Performance Analysis of Variable Cross-Section Wing Sail Based on Discrete Deformation Structure (I), pp. 1-6

Wu Hao	Huazhong University of Science and Technology
Yang Shaolong	Huazhong University of Science and Technology
Liu Chang	Huazhong University of Science and Technology
Xiang Gong	Huazhong University of Science and Technology

WesAfternoonC	**Building 1 Room 312**
Swarm Coordination, Vessel Shape Optimization, and Collaborative Estimation for Marine Vehicles (Part II) (Regular Session)	
Chair: Ambrosovskaya Elena	Navis JSC
Co-Chair: Liu Zongyang	Huazhong University of Science and Technology
Co-Chair: Hu JinZhuo	Northwestern Polytechnical University

15:38-15:56	**WesAfternoonC.1**

Cooperative Target State Estimation of Multiple AUVs Based on an Enhanced IMM-UKF Approach, pp. 1-6

Hu JinZhuo	Northwestern Polytechnical University
Guo Linyu	Northwestern Polytechnical University
Chen Guofang	Northwestern Polytechnical University
Chen Yimin	Northwestern Polytechnical University
Gao Jian	Northwestern Polytechnical University

15:56-16:14	**WesAfternoonC.2**

Assessing Linear Control Strategies for Zero-Speed Fin Roll Damping, pp. 1-6

Savin Nikita	St. Petersburg Electrotechnical University "LETI"
Ambrosovskaya Elena	Navis JSC
Romaev Dmitry	Navis, Saint Petersburg, Russia
Proskurnikov Anton V.	Politecnico Di Torino

16:14-16:32	**WesAfternoonC.3**

A General Vessel Shape Representation As a Continuous Signed Distance Function Via Gaussian Processes, pp. 1-6

Nygård Trym Anthonsen	Norwegian University of Science and Technology
Lopez Michael Ernesto	NTNU
Brekke Edmund F.	Norwegian Univ. of Science and Technology
Stahl Annette	Norwegian University of Science and Technology

16:32-16:50	**WesAfternoonC.4**

A New Approach to AUV Information Fusion Based on Improved D-S Evidence Theory, pp. 1-6

Li Jiayun	Guangdong Ocean University
Yuan Jianping	Guangdong Ocean University
Wan Lei	Harbin Engineering University
Wang Cenan	Hangzhou Applied Acoustics Research Institute

16:50-17:08	**WesAfternoonC.5**

CAMS
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16th IFAC Conference on Control Applications in Marine Systems, Robotics and Vehicles, 2025
第十六届国际自动控制联合会海洋系统、机器人技术及载运工具控制应用会议

Unmarked AUV Trajectory Prediction Method Based on Principal Component Analysis and AFUKF, pp. 1-6

Li Wenxiang	Dalian Maritime University
Li Yancun	Dalian Maritime University
Zhao Minghui	DMU
Wang Shenghai	Dalian Maritime University
Wei Yi	Dalian Maritime University

WesAfternoonD	**Building 1 Room 211**
GNC for Marine Vehicles (Part II) (Regular Session)	
Chair: Yang Xiaofei	Jiangsu University of Science and Technology
Co-Chair: Li Shijie	Wuhan University of Technology
Co-Chair: Luo Zhongbi	KU Leuven
15:38-15:56	**WesAfternoonD.1**

Model Predictive Path Integral Control for Ship Heading Using Gaussian Process Regression, pp. 1-6

Li Shijie	Wuhan University of Technology
Chen Weibang	Wuhan University of Technology
Liu Jialun	Wuhan University of Technology
Yang Youwei	Wuhan University of Technology

15:56-16:14	**WesAfternoonD.2**

Adaptive Near-Ice Guidance of Underactuated AUV for Under-Ice Detection, pp. 1-6

Wang Andong	Huazhong University of Science and Technology
Liu Gang	Wuhan Second Ship Design and Research Institute
Zhang Jialei	Huazhong University of Science and Technology
Yifan Liu	Huazhong University of Science and Technology
Xiang Xianbo	Huazhong University of Science and Technology

16:14-16:32	**WesAfternoonD.3**

Path Following Control for an Underactuated Autonomous Ship Model Using an L1 Adaptive Controller, pp. 1-6

Xu Haitong	Instituto Superior Técnico, Universidade De Lisboa
Guedes Soares Carlos	InstitutoSuperior Técnico, Technical University of Lisbon

16:32-16:50	**WesAfternoonD.4**

AUTOBargeSim: MATLAB® Toolbox for the Design and Analysis of the Guidance and Control System for Autonomous Inland Vessels, pp. 1-6

Dhyani Abhishek	Delft University of Technology
Haqshenas M. AmirReza	Periskal / KU Leuven
Zhang Chengqian	Chalmers University of Technology
Mahipala Dhanika	Norwegian University of Science and Technology
Tran Hoang Anh	Norwegian University of Science and Technology
Zhang Yan-Yun	KU Leuven
Luo Zhongbi	KU Leuven
Reppa Vasso	Delft University of Technology

16:50-17:08	**WesAfternoonD.5**

A Compensated Line-Of-Sight Guidance Law for Unmanned Surface Vehicles Based on Dual-Mode Compensation Architecture, pp. 1-6

Yan Xin	Nanjing University of Science and Technology
Yang Xiaofei	Jiangsu University of Science and Technology
Xiang Zhengrong	Nanjing University of Science and Technology

WesAfternoonE	Building 1 Room 212
Marine Perception (Part II) (Regular Session)	
Chair: Liu Siyuan	Dalian Maritime University
Co-Chair: Wei Yanhui	Harbin Engineering University
Co-Chair: Zheng Jinrong	Huazhong University of Science and Technology

15:38-15:56	WesAfternoonE.1

Towards Better Data Variation in Maritime Perception Datasets, pp. 1-6

Schmidt Jonathan Eichild	Technical University of Denmark
Rokseth Børge	NTNU
Schliemann-Haug Asger	Lloyd's Register
Galeazzi Roberto	Technical University of Denmark

15:56-16:14	WesAfternoonE.2

MDG-YOLO: A Benthic Organism Detection Algorithm for Degraded Underwater Visual Features Environments, pp. 1-2

Zhao Songhao	Dalian Maritime University
Zou Dehua	Dalian Maritime University
Tian Junwen	Dalian Maritime University
Bin Cheng Chengbin	Dalian Maritime University
Liu Siyuan	Dalian Maritime University

16:14-16:32	WesAfternoonE.3

Parallax-Tolerant Unsupervised Deformable Underwater Image Registration, pp. 1-6

Tian Junwen	Dalian Maritime University
Zou Dehua	Dalian Maritime University
Chu Xuanhe	Dalian Maritime University
Zhou ShiJian	Dalian Maritime University
Liu Siyuan	Dalian Maritime University

16:32-16:50	WesAfternoonE.4

Enhancing Transformer Models with Specialized Optimization for Underwater Fish Classification, pp. 1-6

Mughal Muhammad Waqar	Constructor University
Sun Shixin	Constructor University
Mehdi Syed Atif	University of Central Punjab
Maurelli Francesco	Jacobs University Bremen

16:50-17:08	WesAfternoonE.5

YOLOv8-Twin: A Lightweight, Real-Time Object Detector with Twin-Attention for Autonomous Systems, pp. 1-6

Rashid Muhammad	Huazhong University of Science and Technology
Wang Junfeng	Huazhong University of Science and Technology

| Ahmed Faheem | Huazhong University of Science and Technology |
| Xiang Gong | Huazhong University of Science and Technology |

WesAfternoonF	**Building 1 Room 311**
Machine Learning for Marine Control (Part II) (Regular Session)	
Chair: Ren Zhengru	Tsinghua University
Co-Chair: Wirbel Julius	Technical University of Denmark
Co-Chair: Chen Mingzhi	University of Shanghai for Science and Technology

| **15:38-15:56** | **WesAfternoonF.1** |

Unlock AI Vessel Navigation Assistants: A Community Call for Open Data, pp. 1-6

Wirbel Julius	Technical University of Denmark
Clemmensen Line	University of Copenhagen
Galeazzi Roberto	Technical University of Denmark

| **15:56-16:14** | **WesAfternoonF.2** |

Underwater Litter Grasping Detection Method Based on Deep Learning, pp. 1-6

Zhang Xinyu	University of Shanghai for Science and Technology
Zhu Daqi	University of Shanghai for Science and Technology
Chen Mingzhi	University of Shanghai for Science and Technology
Ji Haoming	University of Shanghai for Science and Technology

| **16:14-16:32** | **WesAfternoonF.3** |

Design and Evaluation of a Motion Prediction-Based Active Heave Compensation System for ROVs Using RNN, pp. 1-6

Xie Shuang	Tsinghua University
Li Xuecheng	China Offshore Fugro Geosolutions (Shenzhen) Co., Ltd
Li Chao	China Offshore Fugro Geosolutions (Shenzhen) Co., Ltd
Zhai Huijie	China Offshore Fugro Geosolutions (Shenzhen) Co., Ltd
Ren Zhengru	Tsinghua University

| **16:32-16:50** | **WesAfternoonF.4** |

A Physics-Informed Neural Network Method-Based Prediction of Ship Rolling Motion, pp. 1-6

Fang Xi	Wuhan University of Technology
Zhu Man	Wuhan University of Technology
Wang Zihao	Shanghai University
Guo Hongtan	Wuhan University of Technology
Tian Kang	Wuhan University of Technology

| **16:50-17:08** | **WesAfternoonF.5** |

Fuel Consumption Prediction for Wing-Diesel Hybrid Ships Using Machine Learning, pp. 1-4

Huo Ziteng	Dalian Maritime University
Liu Zeping	Dalian Maritime University
Gao Yufu	Dalian Maritime University
Guo Yi	Dalian Maritime University
Wang Shenghai	Dalian Maritime University

Han Guangdong   Dalian Maritime University

WesAfternoonG	Building 1 International Exchange Office Meeting Room 112
Hydrodynamics & Vessel Dynamics (Part II) (Regular Session)	

Chair: Yao Chaobang   Huazhong University of Science and Technology
Co-Chair: Tufte Andreas Gudahl   NTNU
Co-Chair: Xiang Jing   Harbin Engineering University

15:38-15:56	**WesAfternoonG.1**

Unified Modelling of Wave-Propelled USVs Using Closed-Form Expressions, pp. 1-6

Tufte Andreas Gudahl   NTNU
Johansen Tor Arne   Norwegian University of Science and Technology
Breivik Morten   Norwegian University of Science and Technology
Ross Andrew John   SINTEF Ocean

15:56-16:14	**WesAfternoonG.2**

Numerical Study on Hydrodynamic Performance of a Three-Dimensional Oscillating Hydrofoil Near the Free Surface in Calm Water, pp. 1-6

Chang Cheng   Huazhong University of Science and Technology
Yao Chaobang   Huazhong University of Science and Technology

16:14-16:32	**WesAfternoonG.3**

Maneuverability Prediction of Ship Nonlinear Motion Models Based on Parameter Identification and Optimization, pp. 1-6

Xiang Jing   Harbin Engineering University
Liu Haoyan   Beijing Institute of Remote Sensing Equipment
Sun Jing   Harbin Engineering University
Xia Guihua   Harbin Engineering University

16:32-16:50	**WesAfternoonG.4**

A Mechanism–Data Fusion Modeling Method for Ship Maneuvering with Environmental Disturbance Compensation, pp. 1-6

Xiang Jing   Harbin Engineering University
Sun Jing   Harbin Engineering University
Liu Haoyan   Beijing Institute of Remote Sensing Equipment
Xia Guihua   Harbin Engineering University

16:50-17:08	**WesAfternoonG.5**

Offline Prediction of 3 DOF Ship Motions Based on Relevance Vector Machine and Free-Running Test Data with Noise, pp. 1-6

Meng Yao   Dalian Maritime University
Zhang Xianku   Dalian Maritime University
Xu Haitong   Instituto Superior Técnico, Universidade De Lisboa
Guedes Soares Carlos   InstitutoSuperior Técnico, Technical University of Lisbon

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	TueAfternoonC.1

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Li Xuecheng	WesAfternoonF.3
Li Yamei	TueAfternoonE.3
Li Yancun	WesAfternoonC.5
Li Yang	TueAfternoonD.3
Li Zheng	TueEarly-AfternoonC.2
Li Zhengyang	TueEarly-AfternoonC.5
Li Zhengyu	WesEarly-AfternoonE.6
Li Zhengzhou	WesEarly-AfternoonG.5
Li Zhihao	WesEarly-AfternoonD.1
Li Zhuohao	WesEarly-AfternoonF.3
	WesEarly-AfternoonF.4
Li Zhuoyue	WesEarly-AfternoonG.6
Li Zihao	WesEarly-AfternoonC.5
Lian Lian	TueEarly-AfternoonC.2
	TueEarly-AfternoonF.2
Liang Peinan	TueEarly-AfternoonA.2
Liang Xiao	WesEarly-AfternoonC.2
Liao Hongjun	TueAfternoonE.4
Lin Yuan	WesEarly-AfternoonB.5
Liu Chang	WesAfternoonB.5
Liu Dianwei	TueAfternoonE.5
Liu Dianyong	WesEarly-AfternoonC.2
Liu Gang	WesEarly-AfternoonA.4
	WesAfternoonD.2
Liu Han	TueEarly-AfternoonA.5
Liu Haoyan	WesAfternoonG.3
	WesAfternoonG.4
Liu Hengling	WesEarly-AfternoonA.4
Liu Jialun	WesEarly-AfternoonD
	WesEarly-AfternoonD.6
	WesAfternoonD.1
Liu Jinhong	TueAfternoonA.2
Liu Lu	TueEarly-AfternoonD.4
Liu Siyuan	WesAfternoonE
	WesAfternoonE.2
	WesAfternoonE.3
Liu Tao	WesEarly-AfternoonF.2
Liu Xiaoxia	WesEarly-AfternoonA.6
Liu Xiaoxu	TueAfternoonB.4
Liu Xing	TueEarly-AfternoonC.5
Liu Xinyu	WesEarly-AfternoonA.4
Liu Yifan	WesEarly-AfternoonE.6
Liu Zeping	TueEarly-AfternoonG.4
	WesAfternoonF.5
Liu Zhi	TueAfternoonE
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Liu Zhongchi	TueAfternoonD
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Liu Zongyang	WesAfternoonC
Longnan Li	WesAfternoonA.1
Lopez Michael Ernesto	WesAfternoonC.3
Louedec Morgan	TueEarly-AfternoonC.6
Loughney Sean	WesAfternoonB.1
Lovrić Josip	TueAfternoonA.1
Lu Guanyu	TueEarly-AfternoonB.6
Lu Jiaxing	WesEarly-AfternoonA.6
Lu YingHao	WesAfternoonA.4
Lu Yiwen	TueEarly-AfternoonA.4
Lund Aimas	TueEarly-AfternoonE.1
Luo Bo	TueAfternoonB.6
Luo Yijie	TueAfternoonA.3
Luo Zhiming	WesEarly-AfternoonE.6
Luo Zhongbi	WesAfternoonD.4
Lyv Xiadong	WesEarly-AfternoonE.3

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Ma Feiyu	TueEarly-AfternoonC.1
Ma Zehui	WesEarly-AfternoonG.4
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Matveev Alexey S.	TueEarly-AfternoonD.3
Maurelli Francesco	WesAfternoonE.4
Mehdi Syed Atif	WesAfternoonE.4
Mei Deqing	TueEarly-AfternoonG.3
Meng Yao	WesAfternoonG.5
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Miao Jianming	WesEarly-AfternoonF
	WesEarly-AfternoonF.3
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Miao Quanli	WesEarly-AfternoonE.2
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Mingyang Xie	WesEarly-AfternoonB
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Mughal Muhammad Waqar	WesAfternoonE.4

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	TueEarly-AfternoonF.4
	TueAfternoonA.1
Ni, Xiong Xiong	WesEarly-AfternoonA.4
Nie Changxing	TueEarly-AfternoonF.3
Nie Hua	TueEarly-AfternoonF.3

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Nie Yong	TueEarly-AfternoonG.3
Ning Jun	TueEarly-AfternoonD
	TueEarly-AfternoonD
	TueEarly-AfternoonD.1
	TueEarly-AfternoonD.2
	TueAfternoonD
Nygård Trym Anthonsen	WesAfternoonC.3

O

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Odetti Angelo	WesEarly-AfternoonA.2
Origane Yuki	TueAfternoonD.2
Ou Zhixin	TueEarly-AfternoonB.5

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Pan Feng	TueEarly-AfternoonC.1
Pan Tianguo	WesEarly-AfternoonB.4
Papageorgiou Dimitrios	TueAfternoonD.4
	WesAfternoonA.5
Park Jong-Yong	WesEarly-AfternoonC.3
Peng Bo	WesEarly-AfternoonB.6
Peng Zhouhua	TueEarly-AfternoonD
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Popov Arseniy	TueEarly-AfternoonD.3
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Prabowo Yaqub Aris	TueEarly-AfternoonE.1
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Qiao Lei	TueAfternoonC
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Qiao Panpan	TueAfternoonF.3
Qin Hongde	TueEarly-AfternoonB.5
Qin Yuanqing	TueAfternoonF.4
Qiu Hairong	TueEarly-AfternoonA.2
Qu Qiang	WesEarly-AfternoonB.1
Qu Sheng	TueEarly-AfternoonD.5
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Ran Qili	TueAfternoonE.2
Rashid Muhammad	WesAfternoonE.5
Ren Mengchen	TueAfternoonF.1
Ren Mengyao	TueEarly-AfternoonA.6

Ren Zhengru	TueAfternoonA.5
	WesEarly-AfternoonB.6
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Reppa Vasso	WesAfternoonD.4
Rokseth Børge	WesAfternoonA.2
	WesAfternoonA.3
	WesAfternoonE.1
Romaev Dmitry	WesAfternoonC.2
Ross Andrew John	WesAfternoonG.1
Rout Raja	TueEarly-AfternoonC
	TueAfternoonC

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Saksvik Ivar	TueEarly-AfternoonG.6
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Scaradozzi David	TueEarly-AfternoonC.6
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Shahnazi Reza	WesEarly-AfternoonD.3
Shan Qihe	TueAfternoonD.3
Shao Wenxi	WesEarly-AfternoonB.4
Shen Qingliang	WesEarly-AfternoonC.1
Shen WeiCheng	WesAfternoonA.4
Shen Xuyu	TueEarly-AfternoonC.3
Shi Yan	WesEarly-AfternoonA.6
Shui Yidi	WesEarly-AfternoonB.4
Si Haojie	WesEarly-AfternoonB.5
Sitorus Andreas Raja Goklas	WesAfternoonA.2
Siyuan He	TueAfternoonA.3
Song Shibo	WesEarly-AfternoonE.2
Song Tianyu	TueEarly-AfternoonE.2
Song Yankong	WesEarly-AfternoonC.2
Sosnowski Stefan	TueAfternoonD.2
Stahl Annette	WesAfternoonC.3
Su Jiachang	TueAfternoonG.5
Su Weihong	TueEarly-AfternoonG.3
Su Xin	TueEarly-AfternoonA.6
	WesEarly-AfternoonA.5
Sun Bing	WesEarly-AfternoonE
	WesEarly-AfternoonE.2
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Sun Jing	WesAfternoonG.3
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Sun Weiwei	WesEarly-AfternoonE.6

Sun Yang	WesEarly-AfternoonE.5
Sun Yu	WesAfternoonB.3
Sun Zhibo	WesEarly-AfternoonA.6

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	WesEarly-AfternoonC.5
	WesEarly-AfternoonC.6
Tang Xiangyu	WesEarly-AfternoonG.5
Tao Peng	TueEarly-AfternoonA.4
Teng Fei	TueAfternoonD.3
Thompson Fletcher	TueEarly-AfternoonE.1
Tian Junwen	WesAfternoonE.2
	WesAfternoonE.3
Tian Kang	WesAfternoonF.4
Tran Hoang Anh	WesAfternoonD.4
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Tu Haiwen	WesEarly-AfternoonG.5
Tufte Andreas Gudahl	WesAfternoonG
	WesAfternoonG.1

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Vié Antoine	WesAfternoonA.5

W	
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	TueEarly-AfternoonF.3
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	TueAfternoonC.4
Wan Lei	WesAfternoonC.4
Wan Yiming	TueEarly-AfternoonB.1
	WesEarly-AfternoonA
	WesEarly-AfternoonA.1
Wang Andong	TueEarly-AfternoonG
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	WesAfternoonD.2
Wang Anqing	TueEarly-AfternoonD
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Wang Aobo	WesEarly-AfternoonF.5
Wang Cenan	WesAfternoonC.4
Wang Dan	TueEarly-AfternoonD.4
Wang Di	TueAfternoonC.2
Wang Gaoxian	TueEarly-AfternoonE.6
Wang Haibin	TueAfternoonE
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Wang Haiyang	WesEarly-AfternoonG.5
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Wang Haotian	WesAfternoonB.2
Wang Jia	TueEarly-AfternoonF.6
Wang Jiaoyan	WesEarly-AfternoonC.1

Wang Jin	WesAfternoonB.1
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Wang Kai	WesEarly-AfternoonA.6
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Wang Ning	TueEarly-AfternoonE
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Wang Shang	TueAfternoonA.2
Wang Shenghai	TueEarly-AfternoonG
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Wang Shufeng	TueAfternoonC.3
Wang Tong	TueEarly-AfternoonC.5
Wang Wei	TueAfternoonA.3
Wang Xiaomin	WesEarly-AfternoonF.6
Wang Xin	WesAfternoonA.4
Wang Yan	TueEarly-AfternoonB.3
	TueEarly-AfternoonB.4
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	TueAfternoonG.2
	TueAfternoonG.3
Wang Yanyun	WesEarly-AfternoonF.3
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Wang Yawei	TueAfternoonG.3
Wang Yingjian	WesEarly-AfternoonA.6
Wang Yixuan	WesEarly-AfternoonA.6
Wang Yu	WesEarly-AfternoonC.1
Wang Yuanhui	WesEarly-AfternoonD.5
Wang Yue	TueEarly-AfternoonG.2
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Wu Chengzhi	TueEarly-AfternoonD.6
Wu Dingyi	TueEarly-AfternoonB.3
	TueEarly-AfternoonB.4
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Wu Hao	WesAfternoonB.5
Wu Haoyu	TueEarly-AfternoonE.6
Wu Huan	TueAfternoonB.6
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	WesAfternoonB.3
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Xie Shuang	WesAfternoonF.3
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Xie Wei	WesEarly-AfternoonE.3
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Xie Yunfeng	WesEarly-AfternoonF.6
Xu Guohua	TueAfternoonF.3
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Xu Haitong	WesAfternoonD.3
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Xu Hui	TueEarly-AfternoonC.1
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Xu Qingqing	TueEarly-AfternoonA.5
Xu Shaofeng	WesEarly-AfternoonA.6
Xu Yalin	TueEarly-AfternoonG.2
Xu Yunze	TueEarly-AfternoonA
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Xu Zifei	WesAfternoonB.3
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Yan Bo	TueEarly-AfternoonE.6
Yan Rundong	WesAfternoonB.1
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Yan Xin	WesAfternoonD.5
Yan Xun	TueEarly-AfternoonB.6
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Yang Chaokun	TueEarly-AfternoonG.3
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Yang Youwei	WesEarly-AfternoonD.6
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Yang Yuchen	WesEarly-AfternoonC.6
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Yao Chaobang	WesAfternoonG
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Ye Peiyun	TueAfternoonD.3
Ye Zhenxia	TueAfternoonC.3
Ye Zhenxia	WesEarly-AfternoonC.5
	WesEarly-AfternoonC.6
Yifan Liu	TueAfternoonB.1
	WesEarly-AfternoonD.2
	WesAfternoonD.2
You Zhuo	TueEarly-AfternoonF.6
Yu Caoyang	TueEarly-AfternoonC
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	TueEarly-AfternoonC.2
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Yu Changdong	WesEarly-AfternoonC.2
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Yuan Jianping	WesAfternoonC.4
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Zereik Enrica	TueEarly-AfternoonF
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Zhai Huijie	WesAfternoonF.3
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Zhang Chen	TueEarly-AfternoonF.5
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Zhang DeSheng	WesAfternoonA.4
Zhang Gang	WesEarly-AfternoonE.6
Zhang Guoqing	WesEarly-AfternoonC.4
	WesEarly-AfternoonD
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Zhang Han	WesEarly-AfternoonE.5
Zhang Hao	TueEarly-AfternoonF.6
Zhang Jialei	TueAfternoonB.1
	WesEarly-AfternoonD.2
	WesAfternoonD.2
Zhang Jianing	WesEarly-AfternoonD.4
Zhang Jiayao	WesEarly-AfternoonE.2
Zhang Jingyan	TueAfternoonE.3

Zhang Lanyong	WesAfternoonA.1
Zhang Lei	TueAfternoonG.5
Zhang Lei	WesEarly-AfternoonD.4
Zhang Lidong	TueEarly-AfternoonE.4
Zhang Lite	TueEarly-AfternoonA.4
Zhang Mengwei	WesEarly-AfternoonB.6
Zhang Miao	WesEarly-AfternoonG.6
Zhang Mingjun	WesEarly-AfternoonG.4
Zhang Qi	TueEarly-AfternoonA.6
	TueAfternoonA
	TueAfternoonA.5
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Zhang Shouxu	TueAfternoonB.4
Zhang Tiedong	TueEarly-AfternoonB.6
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Zhang Yikun	TueEarly-AfternoonA.5
Zhang Yinghao	WesEarly-AfternoonA.4
Zhang Yu	TueAfternoonG.1
Zhang Yun Fei	TueEarly-AfternoonB.4
Zhang Zhao	WesEarly-AfternoonC.2
Zhang Zhuo	TueEarly-AfternoonC
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Zhang Zhuxin	WesEarly-AfternoonF.3
	WesEarly-AfternoonF.4
Zhao Baode	TueAfternoonC.2
Zhao Licheng	TueEarly-AfternoonB.2
Zhao Minghui	WesAfternoonC.5
Zhao Qiaosheng	TueAfternoonF.1
Zhao Songhao	WesAfternoonE.2
Zhao Yang	TueAfternoonB.4
Zhao Yi	WesEarly-AfternoonC.4
Zhao Yitong	TueAfternoonA.2
Zhao Yuanhe	TueEarly-AfternoonB.2
Zhao Zijie	TueAfternoonE.4
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Zheng Jinrong	TueEarly-AfternoonB.3
	TueEarly-AfternoonB.4
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Zhu Chao	TueAfternoonB.4
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Condition-based monitoring in marine systems	TueAfternoonA.2, WesAfternoonB.4, WesEarly-AfternoonE.5
Control applications in marine renewable energy	TueAfternoonG.2, WesAfternoonB.5, WesAfternoonG.1, WesEarly-AfternoonB.3, WesEarly-AfternoonB.4
Cooperative navigation and control	TueAfternoonE.3, TueEarly-AfternoonC.1, TueEarly-AfternoonD.6, WesEarly-AfternoonB.2, WesEarly-AfternoonC.4, WesEarly-AfternoonC.5, WesEarly-AfternoonC.6, WesEarly-AfternoonE.5, WesEarly-AfternoonF.1

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D	
Decision support and safe operation	TueAfternoonE.2, WesAfternoonB.1, WesAfternoonB.3, WesAfternoonF.1, WesAfternoonF.5
Dynamic positioning & position mooring systems for ships & platforms	TueEarly-AfternoonE.4, WesAfternoonB.2, WesEarly-AfternoonG.2

E	
Environmental monitoring	TueAfternoonA.3, TueEarly-AfternoonE.2, WesAfternoonE.4, WesAfternoonG.1, WesEarly-AfternoonB.5, WesEarly-AfternoonE.3

F	
Fault tolerant control and fault handling for marine vessels	WesEarly-AfternoonA.1

G	
Guidance, navigation and control (GNC) of marine vessels	TueAfternoonB.5, TueAfternoonD.4, TueEarly-AfternoonC.5, TueEarly-AfternoonD.4, TueEarly-AfternoonE.5, TueEarly-AfternoonF.3, TueEarly-AfternoonG.6, WesAfternoonD.1, WesAfternoonD.2, WesAfternoonD.4, WesEarly-AfternoonC.3, WesEarly-AfternoonD.1, WesEarly-AfternoonD.6
Guidance, navigation and control (GNC) of unmanned marine vehicles (surface and underwater)	TueAfternoonB.2, TueAfternoonB.5, TueAfternoonB.6, TueAfternoonC.3, TueAfternoonD.2, TueAfternoonE.4, TueAfternoonF.2, TueAfternoonF.3, TueAfternoonF.4, TueEarly-AfternoonB.2, TueEarly-AfternoonC.1, TueEarly-AfternoonC.3, TueEarly-AfternoonC.4, TueEarly-AfternoonC.6, TueEarly-AfternoonD.1, TueEarly-AfternoonD.2, TueEarly-AfternoonD.3, TueEarly-AfternoonD.5, TueEarly-AfternoonD.6, TueEarly-AfternoonE.4, TueEarly-AfternoonE.6, TueEarly-AfternoonF.1, TueEarly-AfternoonF.2, TueEarly-AfternoonF.4, TueEarly-AfternoonF.5, TueEarly-AfternoonG.2, WesAfternoonC.5, WesAfternoonD.3, WesAfternoonD.5, WesEarly-AfternoonC.2, WesEarly-AfternoonC.3, WesEarly-AfternoonC.4, WesEarly-AfternoonC.5, WesEarly-AfternoonC.6, WesEarly-AfternoonD.2

H	
Habitat mapping and surveillance	TueEarly-AfternoonE.1
Human-machine interaction in marine systems	WesAfternoonA.1, WesAfternoonF.1
Hybrid power generation in marine systems	TueAfternoonG.3

I	
Information systems and methods in marine applications	TueEarly-AfternoonG.4

Intelligence and autonomy in marine systems and operations	TueAfternoonA.1, TueAfternoonC.5, TueAfternoonD.1, TueAfternoonD.4, TueAfternoonE.2, TueAfternoonE.4, TueAfternoonF.1, TueEarly-AfternoonE.5, TueEarly-AfternoonF.4, TueEarly-AfternoonG.2, TueEarly-AfternoonG.5, WesAfternoonA.2, WesAfternoonC.1, WesAfternoonE.4, WesAfternoonF.3, WesAfternoonG.5, WesEarly-AfternoonD.4, WesEarly-AfternoonE.1, WesEarly-AfternoonE.3, WesEarly-AfternoonF.1, WesEarly-AfternoonF.3, WesEarly-AfternoonF.4
Internet of things (IoT) in maritime domain	TueAfternoonG.1, TueAfternoonG.3

M

Marine swarms of heterogeneous agents	WesEarly-AfternoonC.1, WesEarly-AfternoonF.1
Marine traffic systems & intelligent marine transportation systems	TueAfternoonG.5, WesAfternoonF.5, WesEarly-AfternoonB.2, WesEarly-AfternoonC.4
Maritime robotics (underwater, surface, aerial)	TueAfternoonB.2, TueAfternoonB.5, TueAfternoonC.2, TueAfternoonD.5, TueAfternoonF.2, TueEarly-AfternoonB.1, TueEarly-AfternoonB.5, TueEarly-AfternoonB.6, TueEarly-AfternoonC.1, TueEarly-AfternoonC.5, TueEarly-AfternoonC.6, TueEarly-AfternoonD.5, TueEarly-AfternoonE.1, TueEarly-AfternoonE.4, TueEarly-AfternoonE.6, TueEarly-AfternoonF.4, TueEarly-AfternoonF.6, WesAfternoonA.4, WesAfternoonC.3, WesAfternoonC.4, WesAfternoonD.5, WesAfternoonE.4, WesAfternoonF.2, WesAfternoonG.5, WesEarly-AfternoonA.2, WesEarly-AfternoonB.1, WesEarly-AfternoonB.2, WesEarly-AfternoonB.6, WesEarly-AfternoonC.2, WesEarly-AfternoonD.5, WesEarly-AfternoonE.4, WesEarly-AfternoonF.2, WesEarly-AfternoonF.3, WesEarly-AfternoonF.4, WesEarly-AfternoonF.5, WesEarly-AfternoonG.5
Maritime safety and security for ports and ships	TueAfternoonA.1, TueEarly-AfternoonA.3, TueEarly-AfternoonE.2, WesAfternoonA.3, WesAfternoonE.1, WesEarly-AfternoonE.3
Modeling, identification, simulation, and control of marine systems	TueAfternoonB.4, TueAfternoonB.6, TueAfternoonD.2, TueAfternoonF.1, TueAfternoonF.3, TueAfternoonF.4, TueAfternoonG.5, TueEarly-AfternoonA.5, TueEarly-AfternoonB.6, TueEarly-AfternoonC.2, TueEarly-AfternoonD.1, TueEarly-AfternoonD.3, TueEarly-AfternoonF.6, TueEarly-AfternoonG.3, WesAfternoonA.3, WesAfternoonB.1, WesAfternoonC.3, WesAfternoonD.3, WesAfternoonD.4, WesAfternoonF.3, WesAfternoonF.4, WesAfternoonG.2, WesAfternoonG.3, WesAfternoonG.4, WesAfternoonG.5, WesEarly-AfternoonB.3, WesEarly-AfternoonB.6, WesEarly-AfternoonC.1, WesEarly-AfternoonC.3, WesEarly-AfternoonE.1, WesEarly-AfternoonF.5, WesEarly-AfternoonF.6, WesEarly-AfternoonG.1, WesEarly-AfternoonG.2, WesEarly-AfternoonG.4, WesEarly-AfternoonG.6
Monitoring, diagnosis and fault handling	TueAfternoonA.2, TueAfternoonA.5, TueEarly-AfternoonA.1, TueEarly-AfternoonA.2, TueEarly-AfternoonA.6, WesAfternoonA.2, WesAfternoonC.4, WesEarly-AfternoonA.1, WesEarly-AfternoonA.2, WesEarly-AfternoonA.4, WesEarly-AfternoonA.5, WesEarly-AfternoonE.4

N

Nonlinear and optimal control in marine systems	TueAfternoonD.2, TueAfternoonF.5, TueEarly-AfternoonB.1, TueEarly-AfternoonG.1, TueEarly-AfternoonG.5, WesAfternoonC.2, WesAfternoonD.1, WesAfternoonD.3, WesAfternoonD.4, WesEarly-AfternoonA.6, WesEarly-AfternoonD.3, WesEarly-AfternoonF.2

O

Ocean renewable energy	TueAfternoonG.1, TueAfternoonG.2, TueAfternoonG.3, TueAfternoonG.4, WesAfternoonB.2, WesAfternoonB.4, WesAfternoonB.5, WesEarly-AfternoonB.3, WesEarly-AfternoonB.4
Offshore systems modeling and control	TueAfternoonG.2, WesAfternoonB.2, WesAfternoonB.3, WesAfternoonG.3, WesEarly-AfternoonB.4, WesEarly-AfternoonB.6

R	
Risk and life cycle assessment in marine systems	TueEarly-AfternoonA.4, WesAfternoonA.3, WesAfternoonB.1, WesAfternoonB.3, WesAfternoonB.4

S	
Search and rescuing operations	TueAfternoonD.3, WesEarly-AfternoonB.1, WesEarly-AfternoonC.1
Ship roll stabilization techniques	WesAfternoonC.2, WesAfternoonF.4, WesEarly-AfternoonB.5
Subsea construction and operation	TueAfternoonB.6, TueAfternoonC.2, TueEarly-AfternoonB.3, TueEarly-AfternoonB.4
Supervision and surveillance in marine applications	TueEarly-AfternoonE.1, TueEarly-AfternoonE.2, WesEarly-AfternoonE.4
Surface and underwater vehicles	TueAfternoonA.4, TueAfternoonB.2, TueAfternoonC.2, TueAfternoonC.5, TueAfternoonD.3, TueAfternoonD.5, TueAfternoonE.3, TueEarly-AfternoonB.3, TueEarly-AfternoonB.4, TueEarly-AfternoonC.4, TueEarly-AfternoonC.5, TueEarly-AfternoonF.1, TueEarly-AfternoonF.2, TueEarly-AfternoonF.5, TueEarly-AfternoonG.1, TueEarly-AfternoonG.2, WesAfternoonD.5, WesAfternoonG.3, WesAfternoonG.4, WesEarly-AfternoonC.5, WesEarly-AfternoonC.6, WesEarly-AfternoonD.2, WesEarly-AfternoonD.4, WesEarly-AfternoonD.5, WesEarly-AfternoonF.5, WesEarly-AfternoonF.6, WesEarly-AfternoonG.3, WesEarly-AfternoonG.4, WesEarly-AfternoonG.5, WesEarly-AfternoonG.6

U	
Underwater acoustic communication	TueAfternoonA.3, TueAfternoonB.3
Underwater localization techniques	TueAfternoonA.3, TueAfternoonE.1, TueAfternoonE.5, TueEarly-AfternoonF.6, WesAfternoonC.1, WesAfternoonC.5, WesEarly-AfternoonA.3

V	
Vision, recognition and reconstruction for underwater applications	TueAfternoonC.4, TueAfternoonE.1, TueAfternoonE.5, TueEarly-AfternoonB.5, WesAfternoonE.2, WesAfternoonE.3, WesAfternoonE.5, WesAfternoonF.2, WesEarly-AfternoonE.2

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in Marine Systems, Robotics and Vehicles**
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