IMERIT

Innovative Marine Engineering

iMerit Annual General Meeting 2025

Details:

Friday, June 27, 2025

Westin Hotel & Resort

Keynote Speaker

Mengchu Zhou, Ph,D. & Dist. Professor

New Jersey Institute of Technology

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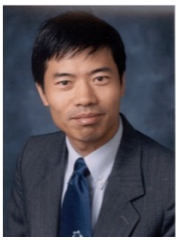
iMerit Annual General Meeting 2025 – Keynote Speaker



MengChu Zhou

Biography: Dr. Mengchu Zhou received his B.S. degree in Control Engineering from Nanjing University of Science and Technology, Nanjing, China in 1983, M.S. degree in Automatic Control from Beijing Institute of Technology, Beijing, China in 1986, and Ph. D. degree in Computer and Systems Engineering from Rensselaer Polytechnic Institute, Troy, NY in 1990. He joined the Department of Electrical and Computer Engineering, New Jersey Institute of Technology in 1990, and is now a Distinguished Professor. His interests are in intelligent Internet of Things, machine learning, and big data analytics. He has over 1300 publications including 17 books, over 900 journal papers including over 700 IEEE Transactions papers, 31 patents and 32 book-chapters. He is presently Senior Editor of IEEE Transactions on Intelligent Transportation Systems, and Associate Editor of Research, IEEE Internet of Things Journal, and Frontiers of Information Technology & Electronic Engineering. He is a recipient of Excellence in Research Prize and Medal from NJIT, Humboldt Research Award for US Senior Scientists from Alexander von Humboldt Foundation, and Franklin V. Taylor Memorial Award and the Norbert Wiener Award from IEEE Systems, Man, and Cybernetics Society, and Edison Patent Award from the Research & Development Council of New Jersey. His work has received over 78800 Google Scholar citations with h-index being 141. He is Fellow of IEEE, International Federation of Automatic Control (IFAC), American Association for the Advancement of Science (AAAS), Chinese Association of Automation (CAA) and National Academy of Inventors (NAI).

Patrolling Strategies of Unmanned Surface Vehicles for Maritime Safety Monitoring

Abstract: Maritime disasters, induced by severe weather, may sink ships and further cause fatalities by accompanying strong winds, storm tides, intense precipitation and destructive ocean waves. Though safer ships and more accurate weather forecasting help ships avoid being caught in trouble, such kind of catastrophes happen from time to time. Unmanned surface vehicles are promising to be an essential part of maritime safety monitoring since they are able to approach travelling vessels, check if vessels are seeking help, and provide timely assistance. This talk provides an overview of optimization methods designed to plan patrolling paths for unmanned surface vehicles and thus enhance maritime patrolling efficiency. For reliable monitoring through physical distress signal transmission, modeling for maritime patrolling is introduced first, with a focus on limited sensing ranges of vessels. To deal with mixed types of decision variables in this model, encoding ways are presented. A series of operators for exploring better solutions are demonstrated accordingly. Ultimately, this talk discusses the needs of coordination methods applied when unmanned surface vehicles are moving towards patrolling targets along with the designed paths.

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8:30	Registration, Coffee, Muffins, Fruits		
9:00 – 9:15	**Dr. Peter T. VanBerkel**, Associate Dean of Industrial Engineering		**Opening Remarks**
9:15 – 10:00	**Mengchu Zhou**	*Ph.D. & Dist. Professor Fellow of IEEE, IFAC, AAAS, CAA and NAI New Jersey Institute of Technology*	**Patrolling Strategies of Unmanned Surface Vehicles for Maritime Safety Monitoring**
10:00 – 10:15	**Coffee Break**		
Morning Session PhD Presentation **Session chair: Hanxiang Zhang**			
10:15 – 10:30	1. Adwaith Nath (via Teams)		Numerical analysis and validation of turning circle and zig-zag maneuvers of kriso container ship in calm sea using body force method
10:30 – 10:45	2. Brendan Smith		Hydrophone array measurements at the Main Endeavour Hydrothermal Vent Field
10:45 – 11:00	3. Emmanuelle Cook		The contributions of ice-cracking and saltation to underwater ambient sound levels in landfast ice.
11:00 – 11:15	4. Hanxiang Zhang		ClearNet: An Adversarial Dehazing Network for Robust Robotic Perception in Challenging Visual Conditions
11:15 – 11:30	5. Ian MacDonald		Development of a methodology for Intelligent Robotic Gripping
11:30 – 11:45	6. Koceila Cherfouth		Review of Emerging Technologies in Electric Motor Propulsion Systems for Water Surface Vehicles
11:45 – 12:45	**Lunch Break**		
Afternoon Session PhD Presentation **Session Chair: Koceila Cherfouh**			
12:45 – 1:00	7. Mehrnaz Alhmadi		A Hybrid Signal Processing Framework for the Acoustic Noise Monitoring of Offshore Wind Turbines
1:00 – 1:15	8. Tuan Trong Nguyen		Mobile manipulation for object grasping and manipulation

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Master Presentation **Session Chair: Koceila Cherfouh**		
1:15 – 1:30	1. Morgan MacKenzie	An introduction to altitude-controlled tow-fish
1:30 – 1:45	2. Mark O'Connor	Model predictive control of underwater tethered payload
1:45 – 2:00	3. Jarrett Brewer	Development of analytical redundancy relations for marine engineering systems for the purpose of fault detection and isolation.
2:00 – 2:15	4. Trishul Shekhar Aich	AI-integrated Smart ICU IV system
2:15 – 2:30	5. Bhargav Kowlagi	Electromagnetic Modeling of a Biological Cell Using Terahertz Spectroscopy
2:30 – 2:45	**Coffee Break**	
2:45 – 3:00	6. Colin Silver	An Analysis of Coverage Path Planning Algorithms for Marine Environments
3:00 – 3:15	7. Mohammad Soroush Izadan	Decoding the Unspoken: Enhancing Social Awareness in Robotic Systems Through Non-Verbal Human Cues
3:15 – 3:30	8. Shane Anderson	Applying Doppler Sonar Techniques in Northern Newfoundland for Fish Tracking Near Mussel
3:30 – 3:45	9. Liam Gregory (via Teams)	Autonomous Pathfinding Through Sea Ice
3:45 - 4:00	10. Van Minh Duong	Cooperative Object Manipulation with Multi-Robot System
4:00 – 4:15	11. Xiaosong Zhang	CircleRRT: Motion-Constrained RRT for Mobile Robot Navigation
4:15 - 4:30	12. Shiyun Wang(PhD)	Utilizing Autoencoder to Generate Realistic WGAN-based Adversarial Traffic
4:30 – 4:45	**Concluding Remarks** Dr. Jason Gu	
4:45 – 5:30	**Session for CREATE Program Committees**	
5:30 -	**Dinner**	