Artificial Intelligence Initiative (Aii)

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Invited Speaker

Dr. Xiaomin Lin, Johns Hopkins University

"Seeing Beneath the Surface: Vision -Enabled Robots for Long-term Ocean Monitoring"

Monday, May 5, 2025 • 10:00AM • HEC 101A • Zoom

Abstract:
Autonomous underwater vehicles (AUVs) and remotely operated vehicles (ROVs) are transforming marine research, defense, and industrial applications. However, significant challenges persist in enabling robust perception, energy-efficient operation, and adaptive autonomy in dynamic underwater environments. This talk explores recent advances in vision-based navigation, multi-modal sensor fusion, and AI-driven decision-making for subsea autonomy. The first part of the talk presents our recent work on simulation-driven learning, leveraging synthetic data for robust underwater perception and localization. The second part highlights advancements in integrating optical, acoustic, and magnetoelectric sensing for stealth navigation and long-distance communication in low-visibility conditions. Two key aspects will be discussed in several applications: (i) multimodal sensing (vision and sonar), and (ii) perception-enabled ROVs for real-time environmental monitoring.

Bio:
Dr. Xiaomin Lin is a Postdoctoral Researcher at the Whiting School of Engineering, Johns Hopkins University, working at the intersection of AI, robotics, and edge computing. He received his Ph.D. in Electrical and Computer Engineering from the University of Maryland, College Park, where his dissertation focused on simulation-driven learning for autonomous underwater systems. His research spans perception-driven autonomy, multi-modal sensing, and efficient AI deployment on edge devices. He serves on the Program Committee for the AAAI 2025 Spring Symposium Series on Generative AI for Edge Computing. His work has been recognized with the Best Paper Award at IROS 2024(Autonomous Robotic Systems in Aquaculture) and the Best Poster Award at the Maryland Robotics Center Symposium. Dr. Lin's research has been funded by USDA, ONR, and AFRL, and he actively collaborates with academia and industry to push the boundaries of subsea autonomy.