College of Engineering
Department of
Mechanical & Industrial Engineering

The Robert W. Courter Seminar Series

3:00-4:00pm, Friday, February 17th, 2023
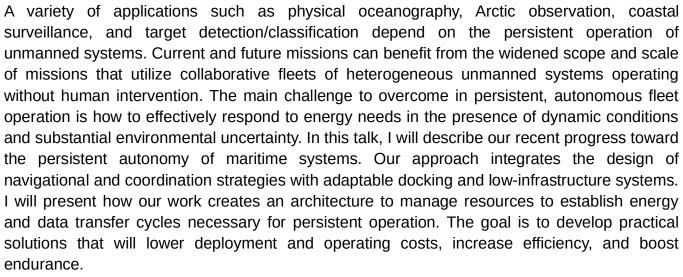## PFT 1253

Enabling Persistent Autonomy in Marine Environments

by Nina Mahmoudian

Associate Professor
B.F.S. Schafer Scholar of Mechanical Engineering
Purdue University

A variety of applications such as physical oceanography, Arctic observation, coastal surveillance, and target detection/classification depend on the persistent operation of unmanned systems. Current and future missions can benefit from the widened scope and scale of missions that utilize collaborative fleets of heterogeneous unmanned systems operating without human intervention. The main challenge to overcome in persistent, autonomous fleet operation is how to effectively respond to energy needs in the presence of dynamic conditions and substantial environmental uncertainty. In this talk, I will describe our recent progress toward the persistent autonomy of maritime systems. Our approach integrates the design of navigational and coordination strategies with adaptable docking and low-infrastructure systems. I will present how our work creates an architecture to manage resources to establish energy and data transfer cycles necessary for persistent operation. The goal is to develop practical solutions that will lower deployment and operating costs, increase efficiency, and boost endurance.

Dr. Nina Mahmoudian is an associate professor and B.F.S. Schafer Scholar of Mechanical Engineering at Purdue University since 2019. Previously, she was the Lou and Herbert Wacker Associate Professor in Autonomous Mobile Systems with the Department of Mechanical Engineering at Michigan Tech. Before Michigan Tech, Mahmoudian was a Research Associate in the Collective Dynamics and Control Lab in the Aerospace Department at the University of Maryland. She received her Ph.D. in Aerospace Engineering from Virginia Tech. Her work focuses on the persistent autonomy of mobile robots and maritime systems. She is an active member of the Institute for Control, Optimization, and Networks (ICON) and Robotics Accelerator at Purdue University. Mahmoudian is a recipient of the 2015 NSF-CAREER and 2015 ONR-YIP awards. She serves as the editor of the International Conference on Robotics and Automation (ICRA) and associate editor of IEEE Robotics and Automation Letters.