

Title: Persistent autonomous maritime operation utilizing underwater docking

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A variety of applications such as physical oceanography, Arctic observation, coastal surveillance, and target detection/classification are performed by unmanned systems and impeded by interuptions for energy replenishment. 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. A novel collapsible portable and vehicle agnostic underwater docking system has been developed. The docking strategy includes approach and terminal homing using acoustic and vision sensing that brings the AUV from far field to complete docking for data/energy transfer. This talk presents recent progress towards persistent autonomy of maritime systems that integrates design of navigational and coordination strategies with adaptable docking and low-infrastructure systems. The goal is to achieve practical solutions that will lower deployment and operating costs, increase efficiency, and boost endurance.

Biography

She received her Ph.D. in Aerospace Engineering from Virginia Polytechnic Institue and State Univerity. Dr. Nina Mahmoudian is an associate professor of Mechanical Engineering at Purdue University. Previously, she was the Lou and Herbert Wacker Associate Professor in Autonomous Mobile Systems with the Department of Mechanical Engineering at Michigan Tech. Dr. Mahmoudian is a recipient of the 2015 NSF-CAREER and 2015 ONR-YIP awards. She has published more than 40 papers peer reviewed journal and conferences and has served an editorial board member of repute.

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