



CoCo Seminar Series Spring 2025

Improving Camera-Based Perception for Underwater Robots

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Assistant Professor, School of Computing,
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Wednesday April 30, 2025 12:00-1:00pm EDT
Hybrid (EB-T1 & Zoom; meeting link available on
<http://coco.binghamton.edu/>)



The need for underwater robots is increasing for applications such as water quality/environment monitoring, fishery management, infrastructure inspection, and heritage site preservation. For most underwater tasks, including the ones listed, it is imperative that the underwater robot has the best perception capability possible. And that is one of the main bottlenecks in underwater robotics today. The sensors that work under water are either expensive or limited – e.g., GPS and Bluetooth are unavailable, IMU data is noisy, camera vision is poor, and sonar data has low resolution. The solution, I believe, is to think outside of the box, be creative in how sensors can inform about the surrounding scene and look for inspiration from other ideas outside of the marine domain. In this talk, I will focus on a select few camera-based work that follow this approach of creativity and underwater application. In addition, I will discuss the current projects that the Marine Robotics Lab is pursuing to expand the capability of underwater robot perception.

Dr. Monika Roznere is an Assistant Professor (2024) in the School of Computing at Binghamton University, where she leads the Marine Robotics Lab. She received her Ph.D. in Computer Science at Dartmouth College. There, she worked with Dr. Alberto Quattrini Li in the Reality and Robotics Lab. Roznere's main research focus is on how to improve the perception capability of low-cost robotic systems while they navigate in challenging environments, underwater and on the water surface. Research pursuits include image enhancement, sensor fusion, camera model, 3D reconstruction, localization, robot design, multi-robot collaboration, and more. In addition, Roznere also focuses on how to design marine robotic frameworks to help in interdisciplinary work such as environmental monitoring and maritime heritage site (e.g., shipwreck) inspection.

Pitch: If attending ICRA 2025 in Atlanta – Roznere is leading the Robots in the Field workshop – submit an abstract or come learn about the state-of-the-art in field robotics!

For more information, contact Hiroki Sayama (sayama@binghamton.edu).

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