

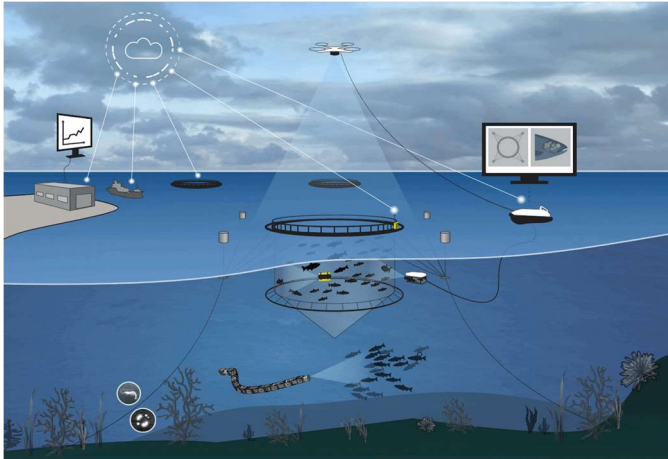
# Autonomous Robotic Systems in Aquaculture

## Research Challenges and Industry Needs



October 14, 2024, Abu Dhabi, United Arab Emirates

A half-day workshop at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), October 14, 2024



### Organizers:

Michael Triantafyllou (MIT Sea Grant)  
Eleni Kelasidi, (SINTEF Ocean)  
Themis Sapsis (MIT)  
Martin Føre, (NTNU)

Submit  
Poster/Video

<https://sites.google.com/view/aquaculture-robotics/home>

### IMPORTANT DATES

Paper submission deadline: **August 20, 2024**  
Notification of acceptance: **September 8, 2024**  
Workshop date: **October 14, 2024**

### TOPIC AREAS INCLUDE:

- Robot design and innovative tools relevant to target challenges in aquaculture
- Robotic platforms and systems for aquaculture applications
- Long-term autonomy, navigation, planning and control in dynamic environments
- Underwater robotic perception and mapping
- Robot-Fish and Robot-Structure interaction
- Machine vision and AI methods for precision aquaculture
- Estimation methods and modeling of environment, flexible structures, fish behaviour
- Methods for biofouling assessment and prevention
- Robust localization in uncertain and dynamic environments
- Sensing technologies for monitoring and inspection in aquaculture
- Sensor System and Data Assimilation
- Tools and methods for intervention and repair operations
- Technology and methods for better fish welfare
- Smart systems towards Industry 4.0 realization in aquaculture
- Decision-making systems towards precision aquaculture
- Digital twin concepts for aquaculture and remote operations
- Docking stations and underwater communication in marine domain
- Risk and Safety in aquaculture industry
- Current and New farming concepts
- Enabling technologies for sustainable aquaculture
- Economics, ethics, and environmental aspects of robotics in the aquaculture industry

### Invited Speakers – Schedule



- Annette Stahl**, Associate Professor, NTNU. **Title:** **Robotic Vision for Autonomous Operations in Aquaculture**
- Donna Lansetta**, CEO and Founder Manna Fish Farms, Inc., **Title:** **Challenges and needs towards future sustainable aquaculture, industry perspective**
- Eleni Kelasidi**, Senior Research Scientist, SINTEF Ocean. **Title:** **Underwater Robotics Solutions for Autonomous IMR Operations in Fish Farms**
- Irfan Hussain**, Assistant Professor, KU. **Title:** **Towards Autonomous Underwater Robotic System for Aquaculture Applications**
- Konstantinos Alexis**, Professor, NTNU. **Title:** **Robust Perception towards Autonomous Operations in Aquaculture**
- Kristine Vedal Størkersen**, Senior Research Scientist, SINTEF Ocean. **Title:** **Current and New Farming Concepts: Relevance of robotic solutions to manage risk and ensure safe aquaculture operations**
- Maarja Kruusmaa**, Professor, Tallinn University of Technology. **Title:** **Bioinspired robotic systems - UCAT for operations in Atlantic fish farms**
- Nadir Kapetanović**, Leading Researcher, University of Zagreb. **Title:** **Multi-Robot System for operations in aquaculture**
- Nikos Papandroulakis**, Research Director, HCMR. **Title:** **Advanced Technological solutions in Mediterranean marine fish farms: Current applications and future needs**
- Robert Vincent**, Assistant Director of Advisory Services, MIT Sea Grant. **Title:** **Sea Grant Strategy for Offshore Aquaculture: Challenges and needs Affecting Sustainable Aquaculture Production**



TECHNICAL COMMITTEE FOR  
**MARINE ROBOTICS**



TECHNICAL COMMITTEE FOR  
**COMPUTER & ROBOT VISION**



TECHNICAL COMMITTEE FOR  
**ALGORITHMS FOR PLANNING AND CONTROL OF ROBOT MOTION**

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