

## Digitilization and Robotics in Aquaculture

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### **Abstract**

An increasing world population raises concerns over food security which, consequently, opens new avenues for food production. Agriculture, Fisheries and Aquaculture are important global contributors to the production of food from land and sea for human consumption. In the last decades, the aquaculture industry has been the faster growing food producing sector in the world while also being known for substantially higher Health, Safety and Environmental (HSE) risks, while still relying heavily on subjective and experience-based decisions and assessments, and intensive manual labor. Therefore, to target current and future challenges in aquaculture with the overall goal to improve efficiency, reduce risks and costs, increase production and sustainability, the industry has shown an increased interest in utilizing autonomy and robotic solutions in a variety of operations. Increasing the level of automation in high-risk operations within aquaculture would lead not only to economical but also social and ethical benefits. This lecture will discuss the utilization of robotic solutions in fish farming industry by conducting a review on challenges, operations and applications in this sector. In addition, suggestions and guidelines on how autonomous operations in complex and dynamically changing environments can be realized by enabling underwater robots as a substitute. This is concluded with directions for future research and innovations needed to follow the currently emerging Precision Fish Farming (PFF) concept which outlines how innovative technologies and automation principles may be used to industrialise, digitise and improve operations in fish farming.

### **Short CV**

Dr. Eleni Kelasidi received the Diploma (MSc) of Electrical and Computer Engineering and the Ph.D degree in Engineering Cybernetics from the University of Patras, Greece, in 2009 and from Norwegian University of Science and Technology (NTNU), Trondheim, Norway, in 2015, respectively. She was a PostDoc Researcher (VISTA Scholar; 2016-2018) at the CoE Centre for Autonomous Marine Operations and Systems, Department of Engineering Cybernetics, NTNU. She is currently Senior Research Scientist and leader of the SINTEF ACE-Robotic Lab - Autonomous and Robotic Aquaculture systems Laboratory in SINTEF Ocean AS.

Topic: IMBBC- Lecture by Dr. Eleni Kelasidi

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