2nd Workshop on **H**ighly **E**merging **R**obotics **O**perations for Remote Sensing of the Environment (HERO 2023)

Theme: Innovative Mission Planning and Pattern Recognition Techniques for UAV Sensing

Organization committee: João Valente, Sergio Velez, Mar Ariza-Sentís and Roberto Valenti

Institutions: Information Technology, Wageningen University and Research, The Netherlands; and Advanced Research and Technology Office, MathWorks, USA.
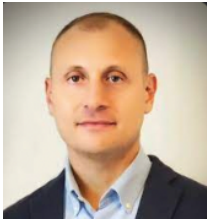
Time: 10.30am-12.30pm

Venue: ROBIO 2023

Agricultural sustainability and environmental conservation have emerged as paramount concerns for governments and nations worldwide. As our global population continues to surge, our finite resources become increasingly scarce with each passing day. In addressing these challenges, it becomes imperative to monitor our planet's evolution beyond daily observations.

Obtaining near-earth data remains a formidable challenge, particularly in intricate and dynamic settings like agricultural fields and natural ecosystems. The deployment of autonomous surveys using robotic and UAV systems presents a timeless and cost-effective solution for data acquisition. Nonetheless, the pressing requirement lies in the development of standardized mission planning and pattern recognition workflows, especially in complex environments marked by time constraints.

This workshop aims to present selected real-world study cases from ongoing European Projects where these topics have been addressed and successfully put into practice and transferred to stakeholders. Finally, two tutorials will be taught to show the designing steps and implementation of such approaches that are currently open-source software solutions.

Programme	
Roberto Valenti, Advanced Research and Technology Office, MathWorks, USA. *MATLAB toolboxes for agriculture and environment monitoring with robotic systems*	15'
Mar Ariza-Sentís, Information Technology Group, Wageningen University & Research, The Netherlands. *Improving Object Detection and Tracking with Coverage Path Planning*	15'
Sérgio Velez, Information Technology Group, Wageningen University & Research, The Netherlands. *Probabilistic maps based on UAV-remotely-sensed parameters for disease detection in woody crops*	15'
João Valente, Information Technology Group, Wageningen University & Research, The Netherlands. *AI, drones & robotics for up close sensing: Selected use cases in ICAERUS and FLEXIGROBOTS EU projects*	15'
Tutorial 1: Hands on with MATLAB software for UAV Path Planning (Mar and João)	30'
Tutorial 2: Hands on with MATLAB software for UAV image analysis (Sergio and João)	30'