



University of Cyprus

Department of Electrical and
Computer Engineering

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Simultaneous Human-ROV monitoring for anomalous command detection during a mission

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Room: XΩΔ02-013

Abstract: Remotely Operated Vehicles (ROVs) are crucial in various safety-critical applications such as real-time monitoring, security, surveillance, and search and rescue missions. Operators controlling ROVs often face stressful conditions and harsh environments, which can lead to involuntary movements and anomalous commands due to fatigue, stress, or other factors. To mitigate this, a simultaneous human-ROV monitoring framework is proposed, integrating bio-signals from the operator and sensory data from the ROV. This framework will be deployed on the ROV and aims to recognize and potentially ignore anomalies, enhancing safety. Wearable, non-invasive sensors and the ROV's IMU sensor provide real-time contextual awareness. A data collection framework is proposed to create a fused dataset from both human and ROV data, including stress induction and assessment techniques to stimulate stress and fatigue that may affect operators during missions. Moreover, we evaluated our idea on different embedded platforms with noteworthy energy and performance benefits, since the aim is for the controller to be deployed directly on the ROV.

Biography: Rafaella Elia is currently a Ph.D. Candidate with a full scholarship in the Department of Electrical and Computer Engineering at the University of Cyprus and a Researcher at KIOS Research and Innovation Center of Excellence. Rafaella has received her B.Sc. degree in Electrical Engineering from the Department of Electrical and Computer Engineering at the University of Cyprus in 2017. Her research interests include biomedical signal processing, machine learning, and pattern recognition with a specific focus on wearable sensors.