

Multidisciplinary Simulation, Estimation, and Assimilation Systems

Seminar Series

Prof. Nuno A. Cruz

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Assistant Professor at the University of Porto, Portugal

Applied Research in Marine Robotics at INESC TEC

Abstract: This talk will address some of the latest developments in marine robotics and how they are being adapted to address new challenges from different communities. Science communities in general want more data (longer space and time series), to measure more parameters, to increase sampling frequencies, and to ensure data quality. They also want to automate processes, from data gathering to processing and communicating, so that these data can be available sooner, and with less risk for operators. Industry also looks for robotic tools to automate processes, replacing operators for better efficiency and safety, reducing logistics and maintenance costs. One of the goals of the robotics community has been to obtain more data about the oceans by extending capabilities in space and time ranges and resolutions. A significant part of this effort has been enabled by a series of autonomous robotic platforms, and many of them are already available off-the-shelf to non-specialist users. However, some of the more demanding challenges cannot be correctly address by these now-ubiquitous solutions and require specific improvements. The Center for Robotics and Autonomous System of INESC TEC in Porto, Portugal, has been involved in many R&D projects developing cutting-edge technology for the sea. The Center aggregates specialists in several competencies associated with autonomous marine robotics, therefore it has participated in multiple international R&D projects to ensure the development of critical subsystems. In some cases, the Center has led the development of complete integrated solutions, assembling a combination of these custom subsystems with others developed by R&D partners. The talk will describe some of these subsystems, together with examples of past and current projects where they are being implemented.

Biography: Nuno Cruz holds a MSc. in Digital Systems Engineering from UMIST, UK, and a PhD. in Electrical Engineering from the University of Porto, in Portugal. He is currently an Assistant Professor at the Faculty of Engineering of the University of Porto and a Coordinator at the Centre for Robotics and Autonomous Systems at INESC TEC. Nuno Cruz is an Associate Editor of the IEEE Journal of Oceanic Engineering and has over 100 publications in journals and proceedings of international conferences. He has been involved in the development and deployment of marine robotic vehicles for more than 20 years. He has led the design of multiple autonomous vehicles at the University of Porto and INESC TEC, namely the Zarco and Gama ASVs and the MARES and TriMARES AUVs. His current research interests include the development of strategies for the efficient use of autonomous vehicles at sea, including the concept of adaptive sampling.

Friday, October 21, 2022

2:00 PM; Rm. 5-314

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Hosts:

Pierre Lermusiaux

<http://mseas.mit.edu>

John Leonard

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Data Assimilation
↑ ↓
Fused Estimation