SHORT VITAE

Carlos Jorge Ferreira Silvestre
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Carlos Silvestre earned his Licenciatura degree in Electrical and Computer Engineering from the Instituto Superior Técnico (IST) at the Universidade de Lisboa, Portugal, in 1987. He continued his studies at IST, completing his MSc in 1991 and his PhD in 2000, both in the same discipline. His doctoral research focused on trajectory tracking and path following guidance and control for autonomous underwater and aerial vehicles. In 2011, he achieved his Habilitation to Full Professor at IST, presenting work on nonlinear sensor-based navigation and control of aerial vehicles.

Since 1996, Carlos Silvestre has held visiting positions at several prestigious institutions. These include the Naval Postgraduate School (NPS) in Monterey, California, where he collaborated with the Department of Aeronautics and Astronautics on robust and gain-scheduled control, navigation, guidance, and control systems for unmanned aircraft. He also worked with the Department of Mechanical Engineering on vehicle and mission control for undersea robots. At the University of California Santa Barbara (UCSB), he contributed to projects on Networked Control Systems and Aerial Vehicles Control at the Center for Control, Dynamical-Systems, and Computation. His work at the University of Bologna in Italy was centered on hybrid control of aerial vehicles, and at CNRS Sophia Antipolis in France, he focused on Sensor-Based Control for autonomous underwater vehicles.

Carlos Silvestre has engaged in extensive scientific cooperation, which includes the exchange of PhD students and Post-Docs, with various institutions. These include the University of California Santa Barbara, University of California Santa Cruz, Georgia Institute of Technology, University of Arizona, University of Aalborg in Denmark, University of Lund in Sweden, University of Bologna in Italy, INRIA Sophia Antipolis in France, Instituto Superior Técnico of the Universidade de Lisboa, and the Centre Automatique et Systèmes from Ecole de MINES ParisTech in Paris, France, University of Science and Technology Beijing, and Shanghai Jiaotong, Shanghai, China.

Since 1993, Carlos Silvestre has been a researcher at the Institute for Systems and Robotics of the Instituto Superior Técnico (ISR-IST). Since 2009, he serves as the Principal Investigator of the Dynamic Systems and Ocean Robotics group (DSORg) at the Laboratory of Robotics and Systems in Engineering and Science (LARSyS), an Associate Laboratory (equivalent to a State Key Laboratory in Portugal). Between 1991 and 1996, he was part of the team that developed MARIUS, the first European civilian autonomous underwater vehicle for environmental surveys in coastal waters. From 1998 to 2000, he participated in the European ASIMOV project, which focused on developing advanced systems for the joint operation of autonomous surface and underwater vehicles, particularly for studying hydrothermal vent activity in the Azores islands.

He led the AIRTICI project with the goal of developing unmanned robotic helicopters as advanced platforms for system design, development, and testing, ultimately to be used as automatic surveying tools for the inspection of critical infrastructures. He also directed the ObservFly project, which aimed to develop a fixed-wing unmanned aircraft for observing ocean cetaceans. This project utilized a tail-sitter aircraft equipped with a real-time computing system, a navigation and control system, and an intelligent mission control system.

Furthermore, he was responsible for the IST's participation in the European TRIDENT project, which aimed to develop an Intervention Autonomous Underwater Vehicle (IAUV).

From 2012 to 2015, Carlos Silvestre was an Associate Professor of the Department of Electrical and Computer Engineering (DECE) at the Faculty of Science and Technology (FST) of the University of Macau, and in 2015, he was promoted to Full Professor, he is on special leave from the Instituto Superior Técnico (IST), Universidade de Lisboa, Portugal since 2012. He is the head of the Department of Electrical and Computer Engineering since July 2024. While at the University of Macau, he established the Sensor-Based Cooperative Robotics laboratory, SCORE Lab, which focuses on developing new sensor-based techniques for cooperative robotics and trajectory tracking and path following for single and multiple agents, applicable to aerial, underwater, and surface vehicles. The laboratory is engaged in various multidisciplinary projects involving advanced robotic systems, including several quadrotors, hovercrafts, the ORVIS underwater vehicle, and the DELMAC surface craft. Between 2013 and 2014, he served as Program Leader, overseeing the Outcome-Based Accreditation of the Degree in Electrical and Computers Engineering with the Hong Kong Institute of Engineers (HKIE), completed in 2015. In 2022 and 2024 he participated, as panel member, in the Peer Review Panels of the European Research Council (ERC).

Over recent years, he has focused his research on navigation, guidance, and control of air, surface and underwater robots, robust multi-model adaptive control, fault detection and isolation, gain-scheduled control, and integrated design of guidance and control systems. His current research interests encompass linear and nonlinear control and estimation theory, hybrid systems, machine learning, multi-agent control systems, networked control systems, and inertial navigation systems. He is also interested in the development of Artificial Intelligence tools for mission control, particularly in the context of unmanned air, surface, and underwater vehicles.

He has taught courses at both undergraduate and graduate levels, including MSc and PhD, in Linear Systems Theory, Robust Multivariable Control Systems, Nonlinear Systems, Digital Control, Real-Time Distributed Control Systems, Robotics, and Digital Signal Processing. He has supervised 21 PhD theses and 36 Master's theses, along with 9 post-doctoral fellows. Currently, he is supervising 6 PhD students in the areas of control and estimation theory, sensor-based guidance, navigation, and control of unmanned vehicles, networked control systems, and hybrid systems.

Carlos Silvestre is co-author of over 180 Journal papers (180 of them ISI), 8 chapters on books, and over 270 papers in international conferences. His ISI Web of Knowledge H-index is 39, he has over 320 papers in Web of Science, with over 5400 citations. His Scopus H-index is 44, and he has over 450 papers, with over 7900 citations. His Google Scholar H-index is 57 with over 11800 citations.

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