DUARTE DIAS

Postdoctoral Researcher
Distributed Intelligent Systems and Algorithms Laboratory (DISAL)
École Polytechnique Fédérale de Lausanne (EPFL) Lausanne, Switzerland
Phone: +351 966420991
E-mail: duartecdiaspuff@gmail.com

EDUCATION

Joint PhD **École Polytechnique Fédérale de Lausanne, Switzerland**
Nov. 2012 - Nov. 2018 **Instituto Superior Técnico, Lisbon, Portugal**

Area: Robotics, Control and Intelligent Systems: Distributed and Cognitive Robotics
Thesis: Distributed State Estimation and Control of Autonomous Quadrotor Formations Using Exclusively Onboard Resources

M.S. **Instituto Superior Técnico, Lisbon, Portugal**
Oct. 2009 - Jun. 2012

Area: Systems, Decision and Control & Computer Science
Thesis: Barcode-based Localization of Low Capability Mobile Robots in Structured Environments

B.S. **Instituto Superior Técnico, Lisbon, Portugal**
Oct. 2006 - Oct. 2009

Area: Electrical and Computer Engineering

WORK EXPERIENCE

Postdoctoral Researcher **École Polytechnique Fédérale de Lausanne**
Nov. 2018 - ongoing **Switzerland**

- Researcher on reducing the computational complexity of sensing and control algorithms in low-capability flying drones.
- Performing system hardware simplification for easy deployment of a fleet of drones.

Visiting Researcher **Massachusetts Institute of Technology, USA**
Aug. 2017 - Nov. 2017 **Space Systems Laboratory**

- Researcher on the SPHERES project (https://www.nasa.gov/spheres/home/), in the ReSWARM 2 sub-project, consisting of deploying distributed algorithms for formation control of multiple robots in a microgravity environment.
- Helping the SPHERES team on logging communications between the astronauts and the MIT team, during test sessions in the International Space Station (ISS).

Research Assistant **École Polytechnique Fédérale de Lausanne, Switzerland**
Nov. 2012 - Nov. 2018 **Instituto Superior Técnico, Lisbon, Portugal**

- Designed vision-based and infrared-based sensor hardware in order to allow autonomous formation flight of multiple drones.
- Designed distributed control algorithms for formation flight of multiple drones with sensory limitations.
- Performed hardware and software integration for autonomous formation flight of drones, and developed a portable vision-based motion capture system to localize and track multiple drones.
- Written multiple peer reviewed publications, see list below.
- Reviewed more that twenty submissions to major conferences and journals.
- Supervised several student/master projects, including one involved in the design of sensing and computation modules for the Moball robot at CalTech JPL: a robot to harvest wind energy from windy environments, such as the surface of Mars.
- In charge of the logistic, management, and grading of Signal Instruments and Signals (B.S.) and Distributed Intelligent Systems (M.S.) courses at EPFL, including also the design of practical sessions, exercises and exams.
- Participated as monitor for summer workshop within the OCJF initiative.

Research Assistant **INESC-ID, Lisbon, Portugal**
Oct. 2009 - Jun. 2010

- Implemented methods for reducing the complexity of electric system models by using reduced parametric models, and adapting those models to the Cadence Spectre Simulator.

M.S. Student **Instituto Superior Técnico, Lisbon, Portugal**
Oct. 2009 - Oct. 2012

- Implementation of network and video streaming protocols on a multi-node wirless Zigbee technology based system.
- Designing vision-based localization and navigation system for an autonomous mobile robot with an 8Kb RAM and 16MIP microcontroller (M.S. Thesis).

SKILLS

Technical Skills:

- Advanced C, C++, Python, MATLAB, Assembly, and SQL Programming
- Mechatronic design with Altium and Solidworks
- PX4, Asctec, and UAVision autopilots for drones
- Robotic tools such as ROS, gmapping/AMCL, Webots, Gazebo

Language Skills:

- Portuguese (mother tongue).
- English experience at B2/C1 Level (Independent User).
- French experience at B1 Level (Intermediate User).
- German experience at A1 Level (Basic User).

PUBLICATIONS

Peer-reviewed papers

1. Distributed Formation Control of Quadrotors under Limited Sensor Field of View, D. Dias, P. U. Lima, A. Martinoli, *Autonomous Agents and Multi Agent Systems (AAMAS)*, Singapore, 2016.

2. On-Board Vision-Based 3D Relative Localization System for Multiple Quadrotors, D. Dias, R. Ventura, P. U. Lima, A. Martinoli, *International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, 2016.

3. Environmental Field Estimation with Hybrid-Mobility Sensor Networks, C. Evans, D. Dias, S. Roelofsen, A. Martinoli, *International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, 2016.

4. Absolute localization for low capability robots in structured environments using barcode landmarks, D. Dias, R. Ventura, *Journal of Automation, Mobile Robotics & Intelligent Systems*, 2013

5. Absolute localization for low capability robots in structured environments, D. Dias, R. Ventura, Proc. RecPad 2011 - *17th Portuguese Conference on Pattern Recognition*, Porto, Portugal, 2011.

Dissertations

1. D. Dias, "Distributed State Estimation and Control of Autonomous Quadrotor Formations Using Exclusively Onboard Resources", PhD Thesis within the IST-EPFL initiative, 2018 (to appear).