

PEDRO ANTÓNIO LOURENÇO

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EDUCATION

All degrees from Instituto Superior Técnico – University of Lisbon, Portugal

PhD. Degree in Electrical and Computer Engineering (currently enrolled) *2013 – 2017 (Expected)*
Currently working on “New techniques for globally convergent simultaneous localization and mapping.”
Work advised by Prof. Paulo Oliveira, Prof. Pedro Batista, and Prof. Carlos Silvestre at the Institute for Systems and Robotics.

MSc. Degree in Aerospace Engineering *2010 – 2012*
Branch of Avionics: guidance, navigation and control; avionic systems; telecommunications
Final average grade of 18 out of 20
Worked on my master’s thesis titled “Analysis, Design and Implementation of an Integrated Simultaneous Localization and Mapping Algorithm” advised by Prof. Paulo Oliveira, Prof. Pedro Batista, and Prof. Carlos Silvestre at the Institute for Systems and Robotics with a research grant.

BSc. Degree in Aerospace Engineering *2007 – 2010*
Final average grade of 17 out of 20
Includes courses of Classical and Fluid Mechanics, Electrical Sciences and Electronics, Computer Science, Mathematics and Control.

EXPERIENCE

Doctoral researcher at Institute for Systems and Robotics *April 2013 - Present*

- Designed novel simultaneous localization and mapping algorithms for autonomous vehicles, essential for indoor operations. Focus on merging advanced theoretical challenges with practical hands-on work for experimental validation with computer vision and acoustic sensors. Achieved performance and reliability guarantees not present in literature.

Undergraduate researcher at Institute for Systems and Robotics *October 2011 – March 2013*

- Analysed, designed and implemented an integrated strategy for simultaneous localization and mapping with cameras and depth sensors (Microsoft Kinect).

Visiting scholar at Sensor-based Cooperative Robotics Laboratory (SCORE), University of Macau, Macao, China *July 2012*
November 2012 – December 2012

- Deployed experimentally sensor-based simultaneous localization and mapping techniques based on Kinect and acoustic range measurements on a Pelican quadrotor.
- Evaluated feasibility of localization techniques for Wi-Fi based algorithms.

Internship at AENA Aeroportos, Spain *July 2011 – August 2011*
Internship at the Division of Airport Services of the Palma de Mallorca Airport.

- Participated on the preliminary stages of the implementation of the airport services management system SGESER, by producing/editing airport plans and the database of available equipment;
- Evaluated the airport situation in terms of IATA’s levels of reference regarding airport services;
- Collected and analysed statistic data, and created predicting models for traffic flow in the bus parking.

AWARDS AND SCHOLARSHIPS

- 2012 **Doctoral scholarship** from the Fundação para a Ciência e Tecnologia
- 2010/2011 **Merit Award** by Instituto Superior Técnico: best M.Sc. student in Aerospace Engineering, 9th best M.Sc. student overall.

SELECTED PUBLICATIONS

- [J3] **P. Lourenço**, B. J. Guerreiro, P. Batista, Paulo Oliveira, and C. Silvestre, "Uncertainty Characterization of the Orthogonal Procrustes Problem with Arbitrary Covariance Matrices," *Pattern Recognition*, vol. 61, pp. 210–220, Jan. 2017.
- [J2] **P. Lourenço**, B. J. Guerreiro, P. Batista, P. Oliveira, and C. Silvestre, "Simultaneous Localization and Mapping for Aerial Vehicles: a 3-D sensor-based GAS filter," *Autonomous Robots*, vol. 40, no. 5, pp. 881–902, Jun. 2016.
- [J1] **P. Lourenço**, P. Batista, P. Oliveira, C. Silvestre, and C. L. P. Chen, "Sensor-based Globally Exponentially Stable Range-Only Simultaneous Localization and Mapping," *Robotics and Autonomous Systems*, vol. 68, pp. 72–85, Jun. 2015.
- [C7] **P. Lourenço**, P. Batista, P. Oliveira, and C. Silvestre, "Towards Uncertainty Optimization in Active SLAM," in *Proc. of the 54th IEEE Conference on Decision and Control*, Osaka, Japan, 2015, pp. 3242–3247.
- [C6] **P. Lourenço**, P. Batista, P. Oliveira, and C. Silvestre, "A Globally Exponentially Stable filter for Bearing-Only Simultaneous Localization and Mapping in 3-D," in *Proc. of the 2015 European Control Conference*, Linz, Austria, 2015, pp. 2817–2822.

LANGUAGES

Portuguese	Mother tongue
English	Full professional fluency (understanding, speaking and writing)
Spanish	Solid understanding and speaking proficiency. Basic writing.
German	Intermediate fluency (understanding, speaking and writing)
French	Basic understanding (listening and reading).

SKILLS

Matlab/Simulink, MS Office, LaTeX	Advanced user
C / C++	Solid knowledge at the level of basic programming, serial and internet communication, and parallel computing
Linux / Python / Robot Op. System	Intermediate user
Solidworks/Autocad/Photoshop	Basic user

OTHER ACTIVITIES & INTERESTS

- Published 3 papers as lead author in international scientific journals on the field of Robotics, and 7 papers as lead author in international conferences on the field of Control.
- Presented my research at 2 international conferences in Europe and 5 local scientific meetings.
- Peer-reviewed more than 20 papers for several international journals and conferences.
- Performed volunteer work as caretaker and group leader/activity organizer, between 2004 and 2009.
- Participated in engineering competitions/courses of BEST and *Ciência Viva*.
- Studied Flute; Self-taught guitar and keyboards player.
- Along with two friends, I bicycled for three weeks and around 1000 km from Tróia, Portugal to Casablanca, Morocco, sharing experiences along the road and getting to know the local culture.
- I am an avid reader, and enjoy swimming, cycling, and playing/composing/listening to music.