Pedro Pereira

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Education

- **KTH Automatic Control Department** — Stockholm, Sweden
  PhD, supervised by Professor Dimos Dimarogonas. — *May 2014 – February 2019*
  - PhD and Licentiate thesis on transportation of cargos with UAVs

- **IST-Lisbon** — Lisbon, Portugal
  MSc, Aerospace Engineering — *2011–2013*
  - Average grade: 18/20 (double degree programme with TU-Delft).

- **TU-Delft** — Delft, The Netherlands
  MSc, Aerospace Engineering — *2011–2013*
  - Average grade: 9/10 (double degree programme with IST-Lisbon).

Work Experience

- **Mynaric** — Gilching, Munich
  Control Engineer in the Embedded Software Development Team — *2019 – Present*
  - I develop and maintain the firmware code of our terminal's FSMs, with a particular focus on improving the tracking speed and stabiltiy. I also develop tools for production to test and calibrate newly assembled FSMs.
  - I develop simulators to test our existing code and to assist our team in tuning our controllers with software first, and hardware later.

- **SML, Smart Mobility Lab** — Stockholm, Sweden
  Research Assistant/Supervisor — *2014 – 2018*
  - I managed the acquisition of material for the Lab (rotorcrafts, RCs, chargers, batteries, etc).
  - I supervised, in cooperation with Antonio Adaldo, the development of the software architecture for deploying missions with rotorcrafts.

- **KTH, Automatic Control Department** — Stockholm, Sweden
  Researcher — *2015 – 2017*
  - EU project AEROWORKS, concerned with the development of software and hardware tools for deploying teams of autonomous aerial vehicles for the purposes of inspection of aging infrastructures. The project was in collaboration with several partners, which included Skellefteå Kraft.
  - My work focused on using aerial vehicles for lifting cargos: aerial tethered transportation with a single UAV for point-mass cargos and with two UAVs for bar-like cargos.

- Aerial tethered transportation with a manipulator and a cable: https://youtu.be/NADR9_VffBk.
- Asymmetric aerial tethered transportation, with non-identical UAVs: https://youtu.be/rgweowQ8fAE.

- **KTH Automatic Control Department** — Stockholm, Sweden
  TA (Teaching Assistant) — *2014 – 2017*
  - Lab Assistant in Water Tank Lab at KTH (2014, 2015, 2016): I supervised students with maintaining a desired water level in a double tank system.
  - Basic Control TA with Henrik Sandberg (2015): I solved exercises demonstrating basic control concepts and techniques.
  - Nonlinear Control TA with Jonas Mårtensson (2016, 2017): I solved exercises demonstrating advanced control concepts and techniques.

- **KTH Automatic Control Department** — Stockholm, Sweden
  MSc thesis supervisor — *2014 – 2017*
  - I supervised several MSc students: my work consisted on setting up a work plan with the students, guiding them with the simulations arrangement, helping them with the experiments setup, and keeping up with their progress in weekly meetings.
  - My six MSc students: Ioannis Chatzis (2015), Riccardo Zanella (2015), Manuel Herzog (2015), Spyridon Papasideris (2016), Massimiliano Pandolfo (2016), Pedro Roque (2017).

- **UCSD** — San Diego, USA
  Visiting Researcher — *March 2018 – May 2018*
  - I had a three month research visit at UCSD, supervised by Professor Jorge Cortés.
  - I worked on developing algorithms for position tracking of aerial vehicles under the presence of unknown wind forces, and on hybrid global stabilization of rigid-body pendulums.

- **DSOR Lab** — Lisbon, Portugal
  Research Engineer — *December 2012 – May 2014*
  - I designed and tested algorithms for accomplishing formations of aerial vehicles.
  - I tested my algorithms at the University of Macau.

Work Projects

- **University of Patras** — Patras, Greece
  Presenter — *October 2019*
  - I was a speaker at the AEROWORKS Autumn School.
  - I presented my work on Control of Single and Multiple Thrust Propelled Systems.

- **IST** — Lisbon, Portugal
  MSc thesis — *2013*
  - I designed and tested leader-follower path planing algorithms, for aerial vehicles. MSc thesis: Three Dimensional Trajectory Planner for Real Time Leader Following.
  - Video at https://youtu.be/yNCJGaRcpkc.

- **IST** Lisbon, Portugal
  Course Project *2012*
  - In *Autonomous Systems*, we designed a mapping algorithm for a Pioneer robot equipped with eight sonars. We also implemented an Extended Kalman filter that used the map being constructed to make corrections to the odometry.
  - Videos: floor map and corridor map.

- **TU-Delft** Delft, The Netherlands
  Course Project *2012*
  - In *Control Systems Lab*, we designed an LQR controller, a Kalman filter and a gain scheduling mechanism to control the position of a container in a container-crane system.
  - Video of the experiment at https://www.youtube.com/watch?v=Ol2MyjcZIXg.

- **TU-Delft** Delft, The Netherlands
  Course Project *2012*
  - In *Advanced Flight Control*, I developed a controller using Reinforcement Learning with the purpose of stabilizing a pendulum in the upward position, when starting in the downward position.
  - The challenge stemmed from the fact that the available torque input was limited, and the algorithm had to learn to swing the pendulum, in order to gain momentum, and, in the long run, reach the upward position.

Skills

- Software skills: Linux, `C++`, C, Python, CMake, Makefile, Qt, Git, SVN, Docker, AppImage, ROS, Gazebo, Mathematica, MATLAB, Simulink
- Spoken languages: English (fluent), Portuguese (native).

Awards

- I received three scholarships for presenting at conferences: two Erik Petersohns Minne scholarships (CDC 2015 and CDC 2017), and one Knut och Alice Wallenbergs scholarship (IROS 2016).
- May 2014: Best MSc thesis of 2013 in Robotics awarded by the Portuguese Society of Robotics.
- 2008–2009, 2009–2010, 2010–2011: Three scholarships for best student in the Aerospace Bachelor Programme at IST-Lisbon.