





Hugo Pereira

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EDUCATION

Instituto Superior Técnico, University of Lisbon Master of Science in Aerospace Engineering (Control & Systems branch)	<i>Aug. 2020 - Nov. 2022</i> GPA: 19 / 20
Technical University of Denmark Exchange Student	<i>Aug. 2020 - June 2021</i> GPA: 11 / 12
Instituto Superior Técnico, University of Lisbon Bachelor of Science in Aerospace Engineering	<i>Sep. 2017 - July 2020</i> GPA: 17 / 20
European Space Agency Ladybird Guide to Spacecraft Communications Training Course	<i>Mar. 2022</i>
University of Twente Summer course in Robotics	<i>Aug. 2019</i>

EXPERIENCE

Institute for Systems and Robotics | ISR Lisbon

Fellow Researcher *Jan. 2023 - Present*

- Currently doing research on spacecraft attitude control, using knowledge from optimal control, numerical optimization, attitude dynamics, and reinforcement learning.

Student Researcher *Mar. 2022 - Dec. 2022*

- Worked towards my master's thesis titled "A Convex Allocation Framework for Singularity Avoidance in Control Moment Gyro Clusters", which was awarded the grade of 20 out of 20.
- Developed algorithms for precise spacecraft maneuvering in the presence of singularities. The proposed solutions involved control theory, convex optimization, and advanced algebra concepts.

Formula Student Lisbon | FST Lisbon

Autonomous Systems Engineer *Sep. 2021 - Sep. 2022*

- Developed autonomous driving algorithms, using ROS/C++, for a driverless Formula car. The algorithms derived encompassed machine learning for point-cloud processing, state estimation via Kalman filter, simultaneous localization and mapping (SLAM), and model predictive control (MPC).
- Competitions: Formula Student Germany 2022, 3rd place in the Driverless Cup; Formula Student Spain 2022, 1st place in the Driverless Cup.

Danish Student Association for Rocketry | DanSTAR

Avionics Systems Engineer *Nov. 2020 - Oct. 2021*

- Member of the electronics department that was in charge of the development of the electrical systems of the rocket. I designed and tested multiple PCBs of the flight computer and was responsible for the telemetry and tracking system. In the end, I carried out flight trajectory simulations, using the Open-Rocket software, that resulted in a predicted apogee error of less than 3%.

- Competition: European Rocketry Challenge 2021, Portugal; Received the 9km flight category award; The team set the altitude world record for collegiate bi-liquid rocketry with an apogee of 6545m AGL.

Aerospace Engineering Students Group | AeroTéc

Student Member

Oct. 2018 - June 2020

- Part of the UAV-ART project, whose goal was to design an autonomous fixed-wing aircraft to navigate through predefined waypoints. During my first year, I was involved in the design and construction of the UAV. In my second year, I took part in the development of the flight controller, which involved PID control, filtering, path planning, sensor fusion, and system identification algorithms. The simulations were carried out in MATLAB/SIMULINK and the on-board controller was implemented in an RPi.
- Gave workshops about rocketry to high schools and college students. These consisted of a hands-on experience in planning, building and launching a small rocket made of cheap conventional materials.

UAVision

Summer Intern

June 2021 - July 2021

- Short-term internship where I worked on the development of a signal demodulation program for an Emergency Position Indicating Radio Beacon system. The program was written in Python, in collaboration with other interns.

SKILLS SUMMARY

Languages	English (C1 certificate), Portuguese (Native)
Programming	C++, C, MATLAB, Python
Software	SIMULINK, KiCad, OpenRocket, SolidWorks
Tools	Git, LATEX, Microsoft Office
Platforms	Linux, Windows, ROS, STM32, PIC24, Arduino
Miscellaneous	Soldering, Driving License

VOLUNTEERING

Erasmus Student Network, DTU section

Feb. 2021 - June 2021

- Member of a multinational team of volunteers whose goal is to facilitate the integration of international students in the local community.
- Organized social events and provided general support and guidance for exchange students.

HONOURS AND AWARDS

- Outstanding Performance at EuRoc 2021, DTU Blue Dot, Oct. 2021
- Academic Merit, Instituto Superior Técnico, 2017/2018, 2019/2020
- Best Student Award, Escola Secundária Marquesa de Alorna, 2015/2016, 2016/2017

HOBBIES AND ACTIVITIES

- Running, swimming, travelling, and playing the guitar.
- Practiced athletics as a federated athlete for 8 years (2009-2017) while competing at the national level.