

# Lourenço Gouveia Faria

AEROSPACE ENGINEERING STUDENT

Lisbon, Portugal

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## Education

### Instituto Superior Técnico

B.S. IN AEROSPACE ENGINEERING (IN PROGRESS - 3RD YEAR)

Average: 15.73/20

Lisbon, Portugal

Oct. 2021 – Present

## Skills

**Programming:** C, Python

**CAD:** SolidWorks

**Additional software:** MatLab, Simulink, Mathematica, Github, Git, OpenRocket, RocketPy, LaTeX, OverLeaf

**Languages:** Portuguese (native), English (C1 Advanced - Cambridge Assessment English), French (A2)

## Extracurricular Activity

### Rocket Experiment Division

CONTROL TEAM MEMBER

Lisbon, Portugal

Apr. 2022 - Present

- Developed a horizontal attitude estimation algorithm for the Camões rocket based on Kalman Filtering. Deep documentation of the navigation work being done inside the project was made. The filter takes GNSS and acceleration data and predicts the rocket's kinematic behaviour along the Earth's surface while removing Gaussian noise from the raw readings.
- Set up a script for Camões' flight dispersion analysis using RocketPy's software to perform Monte Carlo simulations. RocketPy is a next-generation trajectory simulation solution for High-Power Rocketry and its code is written as a Python library. These simulations are crucial to estimate the apogee, drogue and main parachute openings and landing zones of the rocket.
- Developed a protocol that allows the main onboard computer to detect the current flight stage of the rocket. This is important for the activation of the air brakes subsystem in the coast phase of the flight and for the recovery of the rocket, mainly the deployment of the drogue and main parachutes.
- Developed a vertical attitude estimation algorithm for the Baltasar rocket based on Kalman Filtering. This estimator was crucial for the air brakes subsystem that granted the S3 flight award in EuRoC 22. The filter takes barometric and acceleration input and predicts the rocket's kinematic behaviour along the Earth's vertical as it removes Gaussian noise from the raw readings.

### Astro Pi - Mission Space Lab

SECONDARY SCHOOL STUDENT

Ponta Delgada, Azores, Portugal

Oct. 2020 - Jun. 2021

- Developed an algorithm that calculates the location of the magnetic poles of any planet or star by using the Astro Pi computer onboard the International Space Station to map Earth's magnetic field. A magnetometer from a Raspberry Pi Sense Hat was used to collect data from the Earth's magnetic field and the International Space Station's position was registered throughout its 2 orbit runtime. Wolfram Mathematica was the software chosen for the data analysis.

## Work Experience

### Observatório Astronómico de Santana, Açores (local astronomical observatory)

OTLJ PROGRAMME - SUMMER OCCUPATION

Santana, Azores, Portugal

Aug. 2020 & Aug. 2019

- Worked as a receptionist, set up computerized telescopes for night observations, and managed the stock of souvenirs being sold.

## Honors & Awards

Oct. 2023 & 2022

**2x 2nd Overall (RED)**, EuRoC

Santa Margarida Military Camp, Portugal

Oct. 2023

**Payload award (RED)**, EuRoC

Santa Margarida Military Camp, Portugal

Oct. 2022

**S3 flight award (RED)**, EuRoC

Santa Margarida Military Camp, Portugal

Jul. 2021

**Winning Team (Mag-AZ)**, Astro Pi - Mission Space Lab

Escola Secundária Domingos Rebelo, Portugal

## Publications

### Modelling the Earth's magnetic field

UNIVERSITY OF THE AZORES

DOI: 10.1119/5.0074846

Ponta Delgada, Azores, Portugal

May 2022