

Education

- 2023 – Present **Ph.D. in Robotics**, *University of Michigan, USA*
CGPA: 4.0/4.0
- 2019 – 2023 **M.Eng. in Aeronautical Engineering**, *Imperial College London, UK*
CGPA: First Class Honours
- 2016 – 2019 **High School Diploma in Science & Technology**, *Grande Colégio Universal, Portugal*
CGPA: 20/20

Awards and Scholarships

- 2021, 2022 **UROP Bursary (x2)** from the [Faculty of Engineering at Imperial College London](#)
Selective bursary funding 12-week-long summer research placements (totaling over £8'000).
- 2022 **Student and Developing Countries Travel Award** from [IROS 2022](#)
Awarded to help cover travel costs for IROS 2022 (JP¥80'000).
- 2022 **General Award** from the [Old Centralians' Trust at the City & Guilds College Association](#)
Prestigious scholarship funding travel, registration and subsistence for IROS 2022 (over £1'600).
- 2022 **Most Innovative Project Award** by [Department of Aeronautics at Imperial College London](#)
For design of path planning and thermal detection algorithms for a search-and-rescue UAV.

Research Experience

- 09/2023 – Present **Probabilistically Safe Robotic Control & Planning**
Advisor: [Dmitry Berenson, Autonomous Robotic Manipulation Lab](#), University of Michigan
◦ Developing learning and formal methods for safety-critical control under uncertainty.
- 07/2023 – 09/2023 **UAVs for Maritime Search and Rescue**
Advisors: [José Escribano Macias](#), Imperial College London
[Panagiotis Angeloudis, Transport Systems & Logistics Lab](#), Imperial College London
◦ Determined optimal search height for IR-based drone to save people at sea under uncertainty [C3].
- 07/2022 – 08/2023 **Robotic Assistive Feeding (UROP 🟩 & M.Eng. Thesis [T1])**
Advisors: [Yiannis Demiris, Personal Robotics Lab](#), Imperial College London
[Eric Kerrigan](#), Imperial College London
◦ Designed mm-accurate URDF model of a unique 41DoF mobile bimanual manipulator.
◦ Derived and implemented C++ inverse-kinematics solver for closed-chain scissor lift attachment.
◦ Developed adaptive position-based impedance controller to compliantly grasp deformable foods.
◦ Developed probabilistic controller for efficient multi-material cutting with partial observability.
- 07/2021 – 08/2023 **Multi-Agent Reinforcement Learning for Autonomous Driving (UROP 🟩)**
Advisor: [Panagiotis Angeloudis, Transport Systems & Logistics Lab](#), Imperial College London
◦ Setup and integrated a fleet of mobile robots, MoCap system, internal lab network and custom Python simulator enabling real-time control and localization to mm accuracy. Trained 15+ doctoral students to use said robotics research testbed.
◦ Developed policies for differential-drive robots to safely navigate tracks with static and dynamic obstacles in simulation [J1], zero-shot deployed control policies on testbed through domain-randomization [C2].
- Summer 2020 **Finding New Relationships between Material Properties (UROP)**
Advisor: [Vito Tagarielli, Department of Aeronautics](#), Imperial College London
◦ Developed tools for data fetching and processing to extract relationships between material properties.

Summer 2019 **Gait Analysis for the Prediction of Neurodegenerative Diseases**


Advisor: [Flora Ferreira](#), [CIICESI](#), Porto School of Management and Technology

- o Raised accuracy of neurodegenerative disease prediction from gait patterns to above 80% [C1].








Publications

Key: * indicates equal contribution and shared authorship;  pdf;  video;  slides;  website;  poster.

Refereed Journals

- [J1] L. Parada*, E. Candela*, **L. Marques**, and P. Angeloudis. "Safe and Efficient Manoeuvring for Emergency Vehicles in Autonomous Traffic using Multi-Agent Proximal Policy Optimisation". *Transportmetrica A: Transport Science*, 2023. 

Refereed Conferences

- [C4] Y. Feng, Q. Ye, F. Adan, **L. Marques**, and P. Angeloudis. "Driving Style Classification using Deep Temporal Clustering with Enhanced Explainability". *26th IEEE International Conference on Intelligent Transportation Systems (ITSC)*, 2023. 
- [C3] **L. Marques**, J. J. E. Macias, and P. Angeloudis. "Probabilistic Planning for Maritime Search and Rescue". *6th International Conference on Dynamics of Disasters (DOD)*, 2023.  
- [C2] E. Candela*, L. Parada*, **L. Marques***, T. Georgescu, Y. Demiris, and P. Angeloudis. "Transferring Multi-Agent Reinforcement Learning Policies for Autonomous Driving using Sim-to-Real". *35th IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022.  
- [C1] **L. Marques**, F. Ferreira, A. Correia, E. Bicho, and W. Erlhagen. "Feature Extraction using Poincaré Plots for Gait Classification". *25th Portuguese Conference on Pattern Recognition (RECPAD)*, 2019. Extended abstract.  

Theses

- [T1] **L. Marques**. "Robotic Assistive Feeding". M.Eng. Imperial College London, 2023.

Teaching

Teaching Assistant

- o [Computing and Numerical Methods 1 \(AERO40003\)](#), Imperial College London (Fall '22, Spring '23)

Service

Mentoring

2024 – Present Artificial Intelligence Portfolio Project, [AI4ALL - Ignite](#) (1 Undergraduate Student)

Institutional - University of Michigan

2024 – Present Professional Development and Networking Chair, [Robotics Graduate Student Council](#)

2023 – Present Graduate Student Representative, [Information Technology Committee](#), [Faculty Senate](#)

Outreach

2023 London International Youth Science Forum, presented [C3] and [Imperial College's Aero](#) facilities

2023 The Great Exhibition Road Festival, showcased [Transport Systems & Logistics Lab's](#) research

Reviewing

Conference [International Workshop on the Algorithmic Foundations of Robotics \(WAFR\)](#) (2024)

Conference [IEEE International Conference on Intelligent Transportation Systems \(ITSC\)](#) (2024)

Professional Memberships

2022 – Present Institute of Electrical and Electronics Engineers (IEEE) - Graduate Student Member

2019 – Present Royal Aeronautical Society (RAeS) - Student Affiliate

Skills

Programming Python, C++, MATLAB

Tools ROS, Git, KiCad, SolidWorks, Fusion 360, OptiTrack, Cura, Arduino, ABAQUS

Media \LaTeX , DaVinci Resolve, OBS

Licenses [RSGB Full Radio License](#)

[Certificates](#)  ESA Spacecraft Communications Training, DEIB

Languages Portuguese (Native), English (Fluent/CEFR C2), Spanish (Intermediate), Mandarin (Beginner)