JULIA LOPEZ GOMEZ

Edinburgh, UK (pre-settlement status) | Mobile: 07857 973 108 | Email address: J.Lopez-Gomez@sms.ed.ac.uk
www.linkedin.com/in/julia-lopez-gomez | www.julialopezgomez.github.io | Bilingual (Spanish and English)

First year PhD student in Robotics, part of the UKRI AI Centre for Doctoral Training in Dependable and Deployable Artificial Intelligence Robotics (CDT-D2AIR), focusing on Motion and Manipulation Planning, Control, Trajectory Optimisation, and Reinforcement Learning. Supervised by Dr Steve Tonneau, and currently a member of the MARBLE Group (Multi-Agent, Reinforcement, Behaviour and Learning) under Prof. David Abel.

EDUCATION

The University of Edinburgh and Heriot-Watt University, UK 2025 – 2029
PhD in Robotics and AI

- Keywords: Motion and Manipulation Planning, Safe Trajectory Optimisation, Learned Skill Representation, Reinforcement Learning, Control.
- Supervision: Dr. Steve Tonneau.

The University of Edinburgh, UK 2020 – 2025
MINF Informatics (1st Class)

- Integrated Bachelor's + Master's in Informatics.
- Activities: Lead at Endeavour Rockets, Class Rep, Academic Families Parent, Makerspace volunteer.

RESEARCH EXPERIENCE

Heriot-Watt University, UK *Sep. 2025 - Present*
Safety Evaluation of NN Control for Drone Delivery Systems

- Investigated robustness and formal safety evaluation of neural network controllers for quadrotor drone delivery with a tethered payload.
- Combined behavioural cloning, adversarial and property-driven training with controller-level verification (Vehicle + Marabou) and reachability analysis (CORA).
- Preparing for submission to SAIV 2026.

LAAS-CNRS and New York University (NYU), Remote *April – May 2025*
Monte-Carlo Tree Search for Manipulation

- Explored the use of Monte-Carlo Tree Search (MCTS) for manipulation in Gymnasium benchmarks.
- Implemented and researched the integration of RL concepts, Monte-Carlo simulations and tree search algorithms with discretised manipulation scenarios.
- Supervision: Dr. Nicolas Mansard (LAAS-CNRS) and Prof. Ludovic Righetti (NYU)

The University of Edinburgh, UK *2023 - 2025*
Optimisation-Based Manipulation Planning in Convex Decompositions of C-free

- Master's Thesis, developing a novel manipulation planning pipeline based on convex optimisation.
- Integrated the Drake robotics toolbox for modelling, optimisation and visualisation; applied concepts from robot kinematics, algebraic rotations and trajectory optimisation.
- Preparing for submission to IROS 2026.
- Supervision: Dr. Steve Tonneau

The University of Edinburgh, UK *2024 - 2025*
Selected Machine Learning Projects

Spring 2025 Designed and evaluated segmentation models (U-Net, CLIP-based, Autoencoder) for pet image segmentation, incorporating robustness testing and an interactive UI.

Fall 2024 Built a deep learning-based human activity recognition system using wearable sensors (Thingy & Respeck), including sleep analysis and real-time classification via an Android app.

Spring 2024 Implemented object detection pipelines using transfer learning (Faster R-CNN, SSD) to improve the detection of occluded sheep.

TEACHING AND WORK EXPERIENCE

Teaching Assistant in Robotics Design Project – *UoE, School of Informatics* Jan. 2026 – Present

- System Design Project (INFR09032), UG3 Level: Coursework Marker and Office Hours. Robot Design, Machine Learning and Vision in Embedded Systems (Raspberry Pi).

Teaching Assistant in Robotics – *UoE, School of Informatics* Fall 2025

- Advanced Robotics (INFR11213), MSc Level: Lab demonstrator, TA and Marker. Robot Kinematics, Path Planning, Trajectory Optimisation and Control.

Makerspace Student Technician – *School of Informatics Makerspace* Jan. 2024 – May 2025

- Volunteering and workshop delivery: 3D printing and design, Raspberry Pi, Arduino and ROS2 basics.
- Assisting Robotics undergraduates in robot-building and using makerspace resources.

Software Engineering Summer Intern – *J.P. Morgan Chase & Co., UK* Summer 2023

- Agile product development: Java, Maven, SQL, Spring Boot, Oracle Databases, react.js.

Teaching Support Provider in Functional Programming – *UoE, School of Informatics* Fall 2022

- Lead a weekly lab to aid 1st year students in their learning of Haskell and Computational Logic.

SELECTED TECHNICAL PROJECTS IN R&D

Payload Software and Electrical Lead – *Endeavour Rockets* Sep. 2022 – Sep. 2024

- Software and electronics lead for CanSat and 3U CubeSat payloads in a student-led team.
- PCB design (Altium), embedded programming (Raspberry Pi), and system integration.
- 2nd place at Mach-23 competition; invited to Airbus CubeSat Day.

Other projects: Assistive laundry-folding robot; simulated drone delivery using A* algorithm; ESA CanSat competition (Microsatellite assembly, Embedded Sensors, PCB, CAD, 3D printing).

RELEVANT SKILLS

- **Robotics:** Robot Planning and Kinematics, Drake Robotics Toolbox, Pinocchio library, ROS.
- **Machine Learning:** ML libraries (PyTorch, Tensorflow, Sklearn, tqdm, wandb), Deep Neural Networks, CNNs, Reinforcement Learning, Image Segmentation (UNet, CLIP, Autoencoder architectures).
- **Programming Languages:** Python (Matplotlib, NumPy, Pandas, OpenCV), Java (Maven, Spring Boot), C/C++ (Memory Management, Linux, Embedded Programming), Haskell, SQL, MIPS Assembly.
- **Mathematics:** Linear and Non-linear Optimization, Mixed-Integer Programming.
- **Tools & Software:** Altium (PCB Design), Fusion 360 (CAD), Git, Jira, Agile development.
- **Other:** Raspberry Pi, Arduino, 3D Printing, Electronics, Circuit Design, Laser Cutting, Soldering.

AWARDS

The Edinburgh Award: Makerspace Student Technician June 2024
Recognising successful performance in the role of Student Technician by completing a technical project, mentoring students in the Makerspace, and delivering relevant workshops.

The Edinburgh Award: Leadership in Student Opportunities April 2023
Recognising leadership, communication, critical thinking, and digital literacy skills as UG3 Rep.

1st Prize Overall in AdaHack Hackathon: Twitter Solves Rubik's Cube November 2022
Used Twitter API to gather Rubik's cube moves from the platform, showing the cube's change in 3D.

Award of Academic Excellence July 2020
Top 10 academic performances in the district of S/C de Tenerife (over 5,000 students) for the last two years of high school and the National University Entrance Exam (EBAU).