JULIA LOPEZ GOMEZ

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Final-year master's student in Informatics, strongly interested in Robotics, Machine Learning, and R&D applied to practical applications. Actively seeking PhD opportunities in Robot Planning and Manipulatoin, the main focus of my 4th and 5th-year dissertations, and eager to continue contributing to pioneering research in this field.

EDUCATION

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

- Relevant modules: Intro to Mobile Robotics, Advanced Robotics, Machine Learning (practical and theoretical), Computer Vision, IoT Systems, Natural Language Processing, Numerical Linear Algebra.
- Activities: Lead at Endeavour Rockets, Class Rep, Academic Families Parent, Makerspace volunteer.

IES Viera y Clavijo, Spain   2018 – 2020
Spanish Baccalaureate in Technological Sciences (equivalent to A-levels)

- Avg. Grade: 100% with Distinction. Top 10 academic performances over 5K+ students.

RESEARCH EXPERIENCE

LAAS-CNRS   April 11th 2025 - Present
Voluntary Project on Monte-Carlo Tree Search for Manipulation (~50-60h)

- Exploring the use of MCTS for manipulation in known benchmarks such as Gymnasium or Metaworld.
- Understanding the integration of RL concepts, Monte-Carlo simulations and tree search algorithms with discretised manipulation scenarios.

The University of Edinburgh   Years 2023 – 2025
MINF Dissertation: Optimisation-Based Manipulation Planning in Convex Decompositions of C-free

- Developed a novel manipulation planning pipeline using state-of-the-art methods for the convex decomposition of the free configuration.
- Designed a mixed-integer quadratic program (MIQP) formulation to compute feasible grasp/release sequences while satisfying configuration space and manipulation constraints.
- Integrated the Drake robotics toolbox for modelling, optimisation and visualisation; applied concepts from robot kinematics, algebraic rotations (SO(3)), and trajectory optimisation.
- Achieved a 1st Class mark.
- Supervisor: Dr. Steve Tonneau.

The University of Edinburgh   Spring 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.

PROJECTS AND TECHNICAL EXPERIENCE IN R&D

Makerspace Student Technician – *School of Informatics Makerspace*   Jan. 2024 – Ongoing

- Developing a self-driven project of controlling a Robotic Arm with ROS2 and Drake.
- Delivered multiple Raspberry Pi, Arduino and 3D design workshops to other university students.
- Volunteering 10-15 hours a week, calibrating 3D printers, preparing electronics, and assisting System Design Project students (3rd year) in robot-building and using makerspace resources.

Payload Software and Electrical Lead – *Endeavour Rockets*   Sep. 2022 – Sep. 2024
- Developed a CanSat and a 3-unit CubeSat as payloads for a student-assembled rocket.
- Learned and designed the circuit schematics and PCBs of the payload with Altium Designer.
- Key skills: Python, Raspberry Pi, embedded programming, parafoil design, etc.
- 2nd position in Combined 3km Launch Vehicle and CanSat category at Mach-23 competition.
- Carried experiments about Microbial Air Sampler, Simulated Life Search, Albedo Detection, etc.
- Invited to Airbus CubeSat day to present our project to other UK satellite student teams.

Other projects:
- **Electronic Laundry Folder:** Manufactured an assistive laundry-folding robot. Skills: Raspberry Pi, Arduino, Python, Fusion360, 3D printing/laser cutting, product development, marketability….
- **Pizza Dronz:** Worked on a simulated drone delivery system using the A* algorithm.
- **CanSat Europe:** Assembled a microsatellite for the ESA CanSat Competition. Learned PCB and CAD design, scientific research, electronics, antenna design, 3D printing, etc.

WORK EXPERIENCE

J.P. Morgan Chase & Co, UK   Summer 2023
Software Engineering Summer Intern
- Agile product development: Java, Maven, SQL, Spring Boot, Oracle Databases, react.js.

UNIVERSITY INVOLVEMENT – Teaching, Mentoring, and Volunteering

3rd and 5th Year Informatics Representative   Years 2022 – 2023, 2024 – Ongoing
- Gathered weekly feedback from over 300 students and communicated it with university faculty.

Informatics Families Parent   Sep. 2024 – Ongoing
- Mentoring and supporting twelve 1st year students at the start of their academic journey.

Informatics Teaching Support Provider   Fall 2022
- Lead a weekly lab to aid 1st year students in their learning of Haskell and Computational Logic (~50h).

RELEVANT SKILLS

- **Programming Languages:** Python (PyTorch, SkLearn, Tensorflow), Java (Maven, Spring Boot), C/C++ (Memory Management, Linux, Embedded Programming), Haskell, SQL, MIPS Assembly.
- **Robotics & Machine Learning:** Deep Neural Networks, CNNs, Robot Planning and Kinematics, Drake Robotics Toolbox, Pinocchio library, Computer Vision, Visual Odometry and Kalman Filters.
- **Tools & Software:** Altium (PCB Design), Fusion 360 (CAD), Git, Matplotlib, NumPy, Pandas, OpenCV.
- **Mathematics:** Linear and Non-linear Optimization, Mixed-Integer Programming.
- **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 exhibited as UG3 Rep.

1st Prize Overall in AdaHack Hackathon: Twitter Solves Rubik's Cube   November 2022
Used the Twitter API to gather Rubik's cube moves from the community, 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).