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 Manipulation, the 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 and New York University, Online April 2025 – May 2025

**Voluntary Project on Monte-Carlo Tree Search for Manipulation (~50-60h)**

* Explored 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.
* Implemented AlphaZero from scratch, achieving policy generation for the selected benchmarks.
* Supervision: Dr. Nicolas Mansard (LAAS-CNRS) and Prof. Ludovic Righetti (NYU)

The University of Edinburgh, UK Years 2023 – 2025

## MINF Dissertation: Optimisation-Based Manipulation Planning in Convex Decompositions of C-free

* Contribution: Developed a novel manipulation planning pipeline capable of formulating manipulation as an optimisation problem for the first time.
* Used state-of-the-art methods to achieve a convex decomposition of the free configuration space.
* Designed a mixed-integer quadratic program (MIQP) to compute feasible grasp/release sequences while satisfying configuration space and manipulation constraints.
* Integrated the Drake robotics toolbox for modelling, optimisation and visualisation.
* 1st Class mark. Supervision: Dr. Steve Tonneau.

The University of Edinburgh, UK 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](https://huggingface.co/spaces/bhenriquezsoto/point-based-segmentation-1).
* *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 MakerspaceJan. 2024 – May 2025

* 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. PCB, CAD, 3D printing.

# 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 – 2025

* Gathered weekly feedback from over 300 students and communicated it with university faculty.

**Informatics Families Parent** Year 2024 – 2025

* 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 (Matplotlib, NumPy, Pandas, OpenCV), Java (Maven, Spring Boot), C/C++ (Memory Management, Linux, Embedded Programming), Haskell, SQL, MIPS Assembly.
* **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).
* **Tools & Software:** Altium (PCB Design), Fusion 360 (CAD), Git, Gira, Agile development.
* **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).