Marc Fabregat

mfabregatj@gmail.com ◇ GitHub ◇ LinkedIn ◇ Portfolio

Robotics engineer with a PhD-level background in motion planning, control, and AI. Proven ability to build, deploy, and optimize robotic systems from concept to real-world application.

Professional Experience

Engineering Research Institute of Elche

Predoctoral Researcher — September 2022 – Present

- Developed a globally optimal redundancy resolution framework for redundant robots using self-motion manifold analysis; published in a Q1 robotics journal.
- Researched, implemented, and benchmarked path planning algorithms for mobile robots, culminating in a novel framework for navigation in complex 3D environments; results published in a peer-reviewed journal.
- Built a neural network model for task feasibility classification in robotic workspaces, reducing planning time by 80%.
- Researched and proposed general strategies for handling kinematic redundancy across various robotic configurations; work resulted in multiple conference publications.

Miguel Hernández University

Teaching Assistant — Spring 2023 – Present

- Computer Vision (Spring 2025): Supervised student final projects involving deep learning and traditional vision pipelines; guided dataset preparation, model architecture choice, and performance evaluation.
- Systems Theory and Control Systems (Spring 2023–2025): Led practical sessions on system modeling, discretization, controller tuning (PID, state-space), and simulation using Simulink.

Miguel Hernández University

Robotics Engineering Intern — September 2020 – July 2022

- Designed and prototyped a hybrid biped climbing robot with magnetic grippers, using CAD and 3D printing.
- Developed the complete ROS 2-based software stack from scratch: implemented C++ drivers for range sensors, autonomous gripper attachment logic, kinematic computation, a graphical interface, and overall system orchestration.
- Performed closed-loop calibration to correct mechanical tolerances in custom parts, ensuring accurate operation of kinematic systems.

Education

Miguel Hernández University

PhD in Robotics — September 2022 – Present

- PhD research stay at Politecnico di Milano (Italy), September – December 2023.

Miguel Hernández University

MSc in Robotics — September 2021 – June 2022

- Graduated with honors (GPA: 9.32/10).

Miguel Hernández University

BSc in Electronics and Automation Engineering — September 2016 – June 2021

- Completed Erasmus exchange at Czech Technical University in Prague (2018–2019).

Technical Skills

- *Programming:* Python, C++, MATLAB
- *Robotics Expertise:* Control, Motion Planning, State Estimation, SLAM, Kinematics, Redundancy Resolution
- *Tools & Frameworks:* ROS 2, Gazebo, Isaac Sim, BehaviorTree.CPP, OpenCV, PyTorch, NumPy
- *Machine Learning:* Deep Learning, Segmentation, Classification, Reinforcement Learning, VLMs, Foundation Models

Misc.

- *Languages:* English (C2), Spanish (native), Catalan (native), German (A2)
- *Publications:* Full list, Personal selection, Google Scholar
- *Awards:* Best Paper (2023), Best Paper Finalist (2024), FPI Fellowship (2022), ValgrAI Scholarship (2021)