

# Fabian Alvarez

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## Summary

Robotics and mechatronics engineer pursuing an MS in Industrial Informatics and Robotics, with experience in **ROS 2** integration, robotic manipulation, automated verification systems, and experimental platforms.

Background spans academic robotics, medical-device R&D, control systems, and multidisciplinary prototyping across research and industrial environments.

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## Experience

**Universidade da Coruña**, Robotics Research Engineer – Galicia, Spain July 2025 – present

- Developed and integrated 5+ experimental robotic setups for a European research project, including UR5e, SoftHand V2 Research, TIAGo Dual, and ABB manipulators
- Built reproducible hardware-software workflows for robotic system implementation, testing, and validation, reducing setup time for experimental runs by 30%
- Contributed to cognitive AI architecture for robotics research, supporting perception, intelligent control, and human-robot collaboration
- Executed 15+ experimental campaigns with researchers, improving system reliability and reproducibility across validation runs

**Universidade da Coruña**, Roboticist – Galicia, Spain Sept 2024 – Mar 2025

- Led UR5e and QBHand integration in **ROS 2**, combining mechanical design in SolidWorks and Inventor with hardware-software validation for robotic manipulation experiments
- Designed custom structural components to improve stiffness, alignment, and repeatability for precise robotic motion
- Implemented robust hardware-software integration workflows with multidisciplinary teams for system validation and deployment
- Applied QA methodologies in simulation and experimental validation to ensure reliable robotic system performance

**Boston Scientific**, Electrophysiology R&D Intern – Heredia, Costa Rica Oct 2023 – Sept 2024

- Built automated verification test systems in **Python** and C++ for a pulsed-field ablation catheter program, reducing manual testing effort by 40% and improving test repeatability
- Supported compliance-focused verification testing and hardware-software integration in electrophysiology R&D
- Researched technologies and methodologies to streamline verification workflows and experimental testing
- Contributed to technical research proposals for new R&D initiatives

**Plasmas for Fusion Energy and Applications Laboratory**, Student Research Assistant – Cartago, Costa Rica Feb 2019 – Oct 2023

- Designed and implemented the DIWO control system for Costa Rica Stellarator 1 using National Instruments DAQ and PXI hardware
- Led laboratory experiments while ensuring data accuracy, repeatability, and system reliability
- Collaborated with multidisciplinary teams on data analysis, control implementation, and experimental execution

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## Education

**MS** **Universidade da Coruña**, MS in Industrial Informatics and Robotics – Galicia, Spain Sept 2024 – Sept 2026

- Focused on robotics, control systems, and industrial automation
- Master's thesis in progress, expected completion by September 2026

**B.Sc.** **Tecnologico de Costa Rica**, B.Sc. in Mechatronics Engineering – Cartago, Costa Rica Feb 2019 – June 2024

- Bachelor's thesis, developed a robotic pick-and-place system using soft robotic hands, achieving over 95% task success rate
- First Place, Purdy Mobility Challenge (Purdy Motors, April 2021)
- First Place, Uinnova (CONARE, September 2021)

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## Leadership and Teaching

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**TEC Space**, Mechatronics Engineer – Cartago, Costa Rica

Jan 2021 – June 2023

- Contributed to amateur rocket, rover, and CanSat projects across propulsion, guidance and control, structural design, and payload integration
- Supported multidisciplinary development of student engineering prototypes

**IEEE - VLSI Instructor**, Instructor – Remote

Jan 2022 – June 2023

- Taught ASIC and VLSI design using open-source tools through full-flow implementation to GDS
- Delivered instruction through the Latinpractice initiative for Latin American students

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## Projects

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**TechToGo - Costa Rica's First Autonomous Delivery Vehicle**

May 2021 – Oct 2022

Designed and tested Costa Rica's first autonomous delivery vehicle for the Purdy Mobility Challenge

- Implemented computer vision and AI algorithms for autonomous navigation
- Won first place in the Purdy Mobility Challenge in April 2021

**Project ALEX - Robotic Humanoid Face – Cartago, Costa Rica**

Jan 2022 – June 2023

Developed a humanoid robotic face based on InMoov within the IEEE Robotics and Automation Society chapter

- Used Jetson Nano, Linux, and **ROS** as the development platform
- Built a technology demonstrator for robotics capabilities

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## Volunteer

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- FIRST Lego League - Project Judge (2022-2023)
- World Robot Olympiad - Open Category Project Judge (2022-2023)
- FIRST Lego League - Volunteer (2026)

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## Skills

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**Robotics and ROS:** **ROS 2** (Humble, Jazzy), **ROS**, MoveIt, Nav2, SLAM, UR5e and QBHand integration

**Programming:** **Python** (advanced), C++ (intermediate), C (intermediate), Java, JavaScript, Verilog

**CAD and Hardware:** SolidWorks, Inventor, Jetson Nano, National Instruments DAQs and PXI Express, FPGA

**Systems:** Linux (Ubuntu, Buildroot), Docker, WSL2

**Languages:** Spanish (native), English (B2+)