

Óscar Barja Lorenzo

Aerospace Engineering Student · Embedded Software and Avionics

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PROFILE

Final-year Aerospace Engineering student focused on embedded software and avionics, with experience in firmware development, hardware-software integration, and software architecture. Interested in deterministic embedded systems, communication protocols, and aerospace technologies.

TECHNICAL SKILLS

- Languages: C, Python, C++
- Embedded Software: ESP-IDF, Driver Development, Abstraction Layers, FreeRTOS, Pico SDK
- Communications: SPI, I2C, UART, Communication Protocols
- Software Engineering: Git, Docker, Devcontainers, CMake, Unit Testing (Cgreen), MISRA C
- Hardware: Basic PCB design in KiCad, design reviews in Altium and Eurocircuits, PCB assembly and validation
- Tools: Multimeter, Logic Analyzer, Soldering Station
- Operating Systems: Linux, Windows

EXPERIENCE

Head of Avionics

Solaris, UVigo Aerotech | Ourense, Galicia | Sep 2024 – Present

Development of embedded software and electronic systems for amateur rocketry, covering subsystem design, implementation, integration, and validation. Technical coordination of a 9-member team, organizing the work and overseeing project progress.

PROJECTS

BMP390 Driver – End-to-End Developer

Feb 2025 – Apr 2025

Developed a complete C driver for the BMP390 barometer on ESP32-S3 using ESP-IDF. Implemented SPI communication, sensor initialization and configuration, and measurement reading and compensation. Validated on real hardware.

Solaris Packet Protocol (SPP) – Project Lead

Apr 2025 – Present

Design and development of a communication protocol that forms the basis of a modular embedded software architecture for avionics. It uses a HAL, a set of services, and a publish-subscribe system to manage producers and consumers independently of the underlying hardware. The system is orchestrated by a hierarchical finite state machine (HFSM). Originally inspired by the CubeSat Space Protocol (CSP) and NASA abstraction principles, SPP aims to become an open standard for amateur rocketry in Spain.

Software Validation Board (SVB) – Design and Validation Support

Dec 2025 – Jun 2026

Validation platform for electronic systems and embedded software developed entirely by the team. Contributed to PCB design, review, assembly, and validation.

EDUCATION

Bachelor's Degree in Aerospace Engineering

University of Vigo | 2023 – Present

CERTIFICATIONS AND LICENSES

- Introduction to GNU Radio with SDR – Cátedra Fundación Oesía-Universidade de Vigo | 27 h
- Python Fundamentals for Engineering – COIAE | 16 h
- MATLAB for Engineering and Research – COIAE | 16 h
- Introduction to AI Development – BIG school | 6 h
- Driving Licence B – DGT | Own vehicle

LANGUAGES

Spanish and Galician (native) | English B2 (ISE II – Trinity College London)