Joao Pedro Miranda Marques

Control Systems Engineer | Closed-Loop Automation, Python, Embedded Systems

Budapest, Hungary | EU Blue Card | EU Relocation / Hybrid

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Profile

Control Systems Engineer with a B.S. in Control and Automation Engineering from UFMG, and hands-on experience building closed-loop automation, data-acquisition, and real-world embedded control systems. Background bridges feedback control, Python automation, signal and sensor data handling, physical system dynamics, and production-grade embedded software. Comfortable turning noisy physical processes into reliable software behavior through modeling, calibration, debugging, repeatable experiments, and field validation.

Skills

Control & Modeling	Feedback control | Closed-loop systems | System dynamics | MATLAB | Simulink
Signal & Data	Signal processing | Filtering | Sensor calibration | Time-series analysis | State estimation
Software	Python | C/C++ | Git | Shell / Bash | CI/CD
Embedded & IoT	ESP-IDF | FreeRTOS | Sensors / actuators | BLE | SPI | I2C | CAN
Validation	Field trials | Unit testing | Debugging | Oscilloscope | Signal analyzer
Languages	Portuguese (native) | English (professional) | German (beginner) | Chinese (beginner)

Education

Universidade Federal de Minas Gerais - UFMG *2017 - 2023 / Brazil*

B.S. in Control and Automation Engineering

- Graduated from UFMG, a top 3 university in Brazil, with a strong foundation in control theory, system dynamics, signal processing, embedded systems, electronics, and software for physical systems.

Experience

Thyssenkrupp Automotive - Embedded Software Engineer *Apr 2025 - Present / Hungary*

- Develop middleware-layer ECU software for steering systems in a large-scale safety-critical automotive program, contributing to coding, debugging, testing, integration, and traceable delivery workflows.

Hofer Powertrain - Embedded Software Engineer *Jul 2023 - Mar 2025 / Hungary*

- Configured AUTOSAR Basic Software (BSW) for Infineon AURIX TriCore ECUs, debugged low-level SPI communication with signal-analysis tools, and built Jenkins pipelines for unit-test verification.

NHL Stenden WAC Labs - Research Intern in Control Engineering *Sep 2022 - Jun 2023 / Netherlands*

- Designed and implemented a Python-based closed-loop automation and data-acquisition stack for electrospray research, integrating laboratory instruments, control logic, and repeatable test execution.
- Generated reliable process datasets for physical-model validation, data analysis, and classification, connecting experimental behavior with control-system and signal-processing foundations.

Vitau Automation - Intern as Embedded Systems Developer *Jan 2022 - Jun 2022 / Brazil*

- Built ESP32-based automation and sensing systems across biogas plant automation, accelerometer-based comfort analysis, and remote monitoring, combining embedded C, scheduling, synchronization, and software interfaces.

Supermix Concreto - Intern as Embedded Systems Developer *Jan 2021 - Jan 2022 / Brazil*

- Owned firmware, electronics, and control logic for a digital hydrometer used on concrete mixer trucks, including sensor calibration, actuator interfaces, BLE feedback, and field validation.
- Developed an ESP32 dual-core FreeRTOS stack with FSM-based control, runtime resource analysis, and software compensation to support reliable real-time water dosing under component wear.

CPE Jr. - Student Engineering Consultancy *Jan 2020 - Jan 2021 / Brazil*

- Progressed from embedded developer to electronics lead and Product Owner, coordinating client-facing engineering delivery with Scrum and Kanban practices.