Mathieu Rigard

Embedded systems engineer · AI automation down to the hardware

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Profile

I have spent eight years building electronic products end to end: schematics and PCB, firmware, desktop and web software, and the test tools that keep it all honest. Since May 2025 I have built AI into my own workflow, from hardware to web applications, to raise quality and productivity.

- From requirements to a working prototype, then into production.
- Quick to understand a large existing system and to be useful in it.
- Robust, maintainable code, tested and documented.
- Remote work across European time zones, with a home lab for hardware debugging.

Skills

AREA	TOOLS AND TECHNOLOGIES
Languages	C, C++, Python, Bash, JavaScript / TypeScript, PHP, Dart
Embedded	STM32, Atmel, ESP32, Raspberry Pi / CM4, BeagleBone Black, FreeRTOS, embedded Linux, Buildroot
Hardware	KiCad, CircuitStudio (Altium), Ethernet, USB 3, I2C, SPI, 1-Wire, power and battery (PMIC)
Software	Qt (C++), Flutter, Astro, MySQL, software architecture, PlantUML
AI	LLM agents (Claude Code, Codex, DeepSeekHarness), MCP servers, speech-to-text, document pipelines
DevOps	Git, Docker, Jenkins, CI, Linux services (systemd), test automation

Experience

Independent engineer · since June 2019

AI automation and agent systems · since May 2025

- Built and run my own AI agent environment: about 70 skills, several MCP servers and some thirty Python tools, deployed as services on a home server.
- Designed Connect Doorstep, a field-reporting service: a volunteer tells a visit out loud in their own language, and AI fills the organization's report form (Flutter Android app, hosted backend).
- Wrote MCP servers that give agents controlled access to an Obsidian vault, a shared drive and document rendering, with authentication and logs.
- Built and host several static websites (Astro, Cloudflare, Hostinger), including mathieurigard.com.

Escape games, serious games and custom embedded systems · since 2019

- Designed and built more than 20 electronic boards, from schematic to prototype, across 15+ board types, running in public rooms for years without a breakdown.
- Wrote the firmware, the touchscreen Qt applications and the web admin tools.
- Wrote functional and technical specifications directly with clients.
- Led system and software architecture on several R&D prototypes, such as an STM32H7 Ethernet board.

Stack: C++, Qt, FreeRTOS, Python, JavaScript, KiCad, STM32, Atmel, Raspberry Pi, CM4, ESP32, Ethernet, USB 3, parallel bus.

Sogilis · Software developer (C++ / Python) · May 2024 – April 2025

Acoustic surveillance system for submarines, defense sector.

- Built a Python framework that drives the product and runs the engineers' test scenarios on its own: average test time **divided by 30**.
- Fixed critical bugs and made the system more stable.
- Implemented signal processing equations in the C++ code base.
- Improved code quality, maintainability and test coverage.

Stack: C++, Python, signal processing.

Elsys Design · Embedded systems engineer · January 2023 – March 2024

Functional test framework for a new hybrid ARMv7 MPU/MCU platform, taken over after the previous developer left.

- Analyzed and refactored the legacy C test code.
- Wrote new functional and validation tests.
- Adapted the tests to each new hardware revision.
- Automated test runs and made the tools more reliable.

Stack: C, STM32CubeIDE, ARMv7 MPU/MCU, Stratix 10 FPGA.

Open · Embedded software engineer · October 2021 – December 2022

Maintenance of a connected electric vehicle charging station near its end of life.

- Updated the embedded firmware after security patches.
- Wrote internal development and DevOps tools.
- Fixed critical bugs affecting stability.
- Improved documentation and maintainability.

Stack: C, C++, Bash, Batch, Buildroot.

CEA · Electronics and embedded systems engineer · September 2018 – November 2020

Custom solution to identify and test cryogenic temperature sensors automatically.

- Designed the full hardware and software solution, from concept to validation.
- Built custom 4-wire multiplexing and a standalone power supply.
- Wrote a Qt desktop interface and a web admin interface.
- Automated the test workflows and the generation of documentation.

Stack: Qt (C++), Python, PHP, JavaScript, MySQL, Raspberry Pi, CircuitStudio (Altium), I2C, SPI, 1-Wire.

Education

- **Licence professionnelle Systèmes embarqués** (bachelor's degree in embedded systems) · Université Grenoble Alpes · 2018–2019
- **BTS Systèmes numériques** (two-year degree in digital systems) · Lycée Saint-Louis · 2016–2018

Languages

- French: native.
- English: professional working proficiency.