Get Your Way – Internship Proposals 2026

[Internship] Setup of an Automated Testing Infrastructure for ESP-IDF Embedded Applications

Description

The startup **Get Your Way** develops embedded devices based on ESP32 microcontrollers, used in demanding industrial and hospital environments. These devices run applications developed with the **ESP-IDF** framework, integrating critical business logic such as communication, state management, display handling, sensors, and user interaction.

In addition, several products rely on **LVGL** (Light and Versatile Graphics Library) to manage graphical user interfaces on embedded displays.

Today, a significant part of the testing process is performed manually or directly on hardware, which limits the ability to automatically and reproducibly test the embedded software.

The objective of this internship is to **design and implement a complete automated testing infrastructure** enabling:

- the writing and execution of **unit tests** for ESP-IDF-based code,
- the execution of tests through **hardware emulation or simulation**,
- and/or the execution of **tests on a physical board connected to a PC**, with the PC acting as an automated test server.

This infrastructure will improve firmware robustness, enable regression detection, and facilitate the integration of embedded software into a continuous integration workflow.

Tasks

The internship will consist of:

a) analyzing the current ESP-IDF firmware architecture to identify testable components and parts requiring abstraction (HAL, drivers, communication layers, business logic)
b) studying available testing tools within the ESP-IDF ecosystem (unit testing frameworks, mocks, test runners, etc.)
c) setting up an automated **unit testing structure** integrated into the existing project
d) exploring **hardware emulation or simulation** approaches (partial or full) for ESP32-based systems
e) designing a solution allowing **a real embedded board to be connected to a PC**, where the PC acts as a test server (automatic flashing, test execution, log collection, result reporting)

f) extending the testing infrastructure to cover **LVGL-based graphical components**, including UI logic, rendering validation, and event handling
g) automating test execution (nightly or weekend runs) and generating simple test reports
h) documenting the testing infrastructure so it can be easily used and maintained by the development team

Key Challenges

- Understanding and navigating an existing ESP-IDF firmware architecture
- Decoupling hardware-dependent code from business logic to improve testability
- Implementing automated tests in an embedded environment
- Handling constraints related to real hardware (timing, communication reliability, stability)
- Testing graphical interfaces built with LVGL in a non-interactive or automated context

Profile

- Student in computer science, electronics, or embedded systems
- Strong interest in low-level development and software architecture
- Knowledge of C/C++ is required
- Experience with ESP32, ESP-IDF, LVGL, unit testing, or CI tools is a plus (but not mandatory)

Availability

January 2026 to **June 2026** (dates and duration are flexible)

Location

Liège city center – **Belgium**

Contact

Antoine Malherbe, CTO, a.malherbe@getyourway.be, +32 492 03 45 25