



Ayoub EL ASRI

Embedded Software Engineer | C/C++, FreeRTOS, HIL

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PROFILE

Double-degree engineer with hands-on STM32 C/C++ and FreeRTOS development, hardware/software integration and automotive ECU validation experience. Work spans embedded prototypes, ROS-based robotics and Python test automation using CANoe, CAPL, Robot Framework and HIL benches.

EXPERIENCE

Capgemini Engineering (October 2023 - Present)

Power & Performance Engineer, Renault / Ampere

Sophia Antipolis, France

January 2025 - Present

Automotive ECU and vehicle-function performance validation

- Automated latency tests on VT System HIL benches using CANoe, CAPL state machines and Robot Framework; configured YAML KPI targets and ran tests through existing GitLab CI pipelines.
- Developed CAPL stress scenarios and Python automation for GLIWA T1 CPU-load monitoring, correlating function activation with per-core utilization.
- Flashed Renesas I/O ECUs with supplier images; investigated a horn defect using Lauterbach TRACE32 and handed debugging evidence to developers.

Tools: CANoe, CAPL, Python, Robot Framework, VT System, GLIWA T1, TRACE32, CAN, LIN, Ethernet, GitLab CI.

Embedded Systems Consultant, Internal R&D

January 2024 - January 2025

WATERCLEANBOT - autonomous marine-robot prototype

- Developed STM32 C/C++ firmware using FreeRTOS for peripheral interfacing, PWM motor control and communication with a Raspberry Pi.
- Integrated ROS navigation using Python and Gazebo; tuned waypoint following and buoy avoidance in pool trials, and adapted an existing MQTT-ROS bridge for remote monitoring.

Tools: STM32, C/C++, FreeRTOS, Raspberry Pi, UART, SPI, I2C, GPIO, PWM, ROS, Gazebo, MQTT, Ubuntu.

Embedded Development, Orange

October 2023 - January 2024

UWB localization demonstrator

- Integrated LIS3MDL magnetometers with DWM1001 UWB boards over I2C, troubleshooting connections and validating sensor acquisition logs.
- Investigated existing tag/anchor firmware and delivered the completed embedded demonstrator with a colleague responsible for the HMI.

Tools: DWM1001, UWB, LIS3MDL, I2C, embedded C++, serial logging.

Akkodis

Embedded Systems Engineer, Work-study

Nantes, France

September 2022 - September 2023

SABRES - autonomous marine-drone embedded prototype

- Selected the bill of materials and built an Arduino Uno/Raspberry Pi prototype; developed object-oriented C++ sensor/motor firmware and tested exchanges in Proteus.
- Adapted team-provided Python navigation code for embedded motor control and communication, then ran it on the physical Raspberry Pi/Arduino setup.

Tools: Arduino Uno, Raspberry Pi, C++, Python, Proteus, sensor acquisition, motor control.

DAVELE

Connected Tools Engineering Intern

Montpellier, France

May - August 2022

Connected monitoring for agrivoltaic experiments

- Developed an Arduino sensor-monitoring system with LoRaWAN transmission and SD-card backup logging.
- Designed the PCB in EAGLE CAD, soldered prototype electronics, and sized and tested the battery as the startup's sole IT/embedded engineering intern.

Tools: Arduino, C++, LoRaWAN, SD-card logging, EAGLE CAD, PCB design, soldering, battery testing.

EDUCATION

Polytech Angers

Engineering degree, Automation and Computer Engineering

Angers, France

2021 - 2023

National School of Applied Sciences (ENSA)

State Engineering degree, Electronics and Embedded Systems

Kenitra, Morocco

2019 - 2023

Double-degree programme: both engineering diplomas awarded in 2023.

SKILLS

Programming: C, C++, Python, CAPL.

Real-time & OS: FreeRTOS, Embedded Linux, Ubuntu.

Hardware: STM32, Arduino, Raspberry Pi; PCB design, sensor and motor interfacing.

Protocols: CAN, LIN, Ethernet, UART, SPI, I2C, GPIO, PWM, MQTT, UWB, LoRaWAN.

Methods & tools: HIL testing, CANoe, VT System, Robot Framework, Lauterbach TRACE32, GLIWA T1, Git, GitLab CI, ROS, Gazebo, EAGLE CAD.

Languages: French (DALF C1), English (TOEIC 960/990; EF SET C2), Arabic (native).

CERTIFICATIONS, AWARDS & ACTIVITIES

- ISTQB Certified Tester - Foundation Level** (May 2025).
- Professional Scrum Master I (PSM I)** (November 2024).
- Professional Scrum Product Owner I (PSPO I)** (September 2026).