Oussama Darouez

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Skills

- **Programming Languages and scripting :** C, C++, Assembly, Python, Bash
- **Communication Protocols :** UART, SPI, I2C, USB-CDC, CAN, Ethernet, TCP/UDP, Wi-Fi, Bluetooth
- **RealTime Operating System :** FreeRTOS
- **Versionning :** Git, GitHub

- **CI/CD :** Github Actions, Docker
- **Development Environments and IDEs:** VS Code, Eclipse, STM32CubeIDE, Arduino IDE, ESP-IDF, MPLAB X, PlatformIO
- **Build Tools :** CMake, Makefile
- **Robotics :** micro-ROS, ROS2
- **Hardware Design Tools :** SolidWorks, KiCad

Experience

OTA-Enabled Smart Plug IoT Device – Freelance Project   **Aug 2025 – Present**
- Developed OTA-enabled smart plug with Wi-Fi SmartConfig, auto device registration, and firmware versioning.
- Added error recovery with failsafe modes, LED indicators, and button commands for user control and reliability.
- Used NVS for persistent configuration, enhancing performance.
  Technologies: Wi-Fi, HTTPS, OTA Firmware Updates, NVS, FreeRTOS, ESP-IDF, Git

Mare Custos –Tunisia   **Jul 2024 – Present**
Firmware Engineer
- Designed and implemented a resilient dual-slot OTA firmware update system over Ethernet, integrating robust bootloader logic with reset cause handling, NVS version tracking, and automated fallback for corrupted updates.
- Developed Peripheral and modules wrappers for Stm32 and Esp32.
- Implemented Custom micro-ROS transports for Stm32.
- Made unit tests using Unity C for the available firmware.
- Fixed GitHub Actions workflows to build firmware on pull request events.
  Technologies: Ethernet (TCP/UDP), USB-CDC, SPI, ADC, DMA, PCNT, CRC, STM32, ESP32, FreeRTOS, micro-ROS, ROS2, PlatformIO, STM32CubeIDE, Docker, Git, GitHub Actions, Unity C (unit testing), Linker Scripts, Startup Files, Bootloader, NVS, Reset Handler, OTA, Patch Files
  Methodologies: Agile (Scrum)

Orange Tunisie –Tunisia   **Jun 2024 – Jul 2024**
Embedded System Engineer Intern
- Developed and optimized FreeRTOS-based task scheduling on ESP32 with UART communication to Raspberry Pi and explored digital sound processing using the I2S protocol.
  Technologies: FreeRTOS, UART, I2S protocol

Academic Projects

Eurobot – INSAT, Tunis, Tunisia   **Sep 2022 – Apr 2023**
- Led design of two robots with integrated mechanical and electrical systems.
- Developed custom GPIO HATs and servo circuits with optocouplers for isolation.
- Implemented PID control on STM32 and ROS1-based communication protocols.
  Skills: Arduino, STM32, PID Control, ROS1, PCB Design, 3D Printing

Community Involvement

Discovery Club Junior – Manouba, Tunisia   **May 2023 – May 2025**
Robotics Instructor
- Taught electronics, PCB design, logic design, and C/C++ programming; mentored Atmega328P register-level projects.
- Served as mentor at **the Robocup Asia Pacific 2024 in South Korea**.

All-China Youth Federation – China   **Nov 2024**
Forum Attendee
- Attended **the Chinese-Arab Youth Development Forum** in China.

Education

National Institute of Applied Science and Technology – Tunis, Tunisia   **Sep 2021 – Present**
Industrial Computing and Automation Engineering

Languages

Arabic: Native — **French:** Professional Working Proficiency — **English:** Professional Working Proficiency