# Houssem Eddine Sfaxi Ras iebal Bizerte tunisie

# **Embedded software developer**

Embedded systems and IoT Developer passionate about embedded software development and technological innovation. Experienced in low-level programming (C, C++), Linux development, and network protocol integration for embedded systems (LoRa, MQTT, WebSocket). Proven experience in designing and testing intelligent solutions for IoT and industrial automation.



#### **EDUCATION**

2019 – 2023

Bachelor's Degree in Computer Engineering - Faculty of Science of Bizerte



#### **WORK EXPERIENCE**

**Embedded Software Developer (Freelancer)** 

- · Developed drivers and low-level software for microcontrollers.
- Implemented real-time communication protocols and optimized system performance.
- Integrated IoT solutions with cloud platforms for data management and analytics.

**Robotics Trainer** 

October.2023 - Present

Creative minds, Ras jebel young science association, Club Smartech

- Mentored 100+ students in robotics workshops using Arduino, sensors, and motor control systems.
- Designed a curriculum for IoT projects (e.g., smart home automation) adopted by 3 local science clubs.

July.2023 - March.2024

IoT & Web Developer

TAC-TIC, Technopole Ghazala, Tunisia

- Developed embedded software for IoT solutions and automation projects.
- Designed and implemented low-level drivers and network communication protocols.
- Created intuitive web applications for IoT monitoring using JavaScript and Node.js.

**PROJECTS** 

Sept. 2024 - Dec. 2024

### **Sea Drone Project**

Developed an autonomous marine drone for navigation and surveillance.

- Designed and implemented an embedded system for real-time data collection and transmission.
- Developed a web interface for remote control and telemetry data display.
- Integrated GPS and IMU sensors for position tracking and navigation stabilization.
- Controlled T200 thrusters using Arduino Mega 2560 and MQTT communication with ESP8266/ESP32-CAM.

Technologies used: Arduino Mega 2560 | ESP8266 | ESP32-CAM | GPS NEO7m | MPU9250 | WebSockets | MQTT | PWM | HTML/CSS/JS

Feb. 2023 - Juin. 2023

**Smart Glasses for Blind Persons** Developed smart glasses for assisting visually impaired individuals.

- Implemented object detection using TinyML and Edge Impulse on ESP32-CAM.
- Integrated real-time audio descriptions via voice synthesis (TTS) on ESP32 DevKit.
- Optimized recognition using FOMO (MobileNet V2) and Arduino IDE.
- Converted and broadcasted audio files via ESP32 GPIO and a speaker.

Technologie used: ESP32-CAM | ESP32 DevKit | TinyML | Edge Impulse | MobileNetV2 | FOMO | Text-to-Speech (TTS) | Python | Audacity

July. 2024 - Sep. 2024

## WebSocket Server for IoT Communication

Development of a WebSocket Server for Real-Time IoT Device Management

- Connection management and automatic device synchronization.
- · Transmission of real-time updates to web clients.
- Scalable and secure architecture for integrating multiple connected devices.

Technologies used: Node.is | Express.is | WebSocket | JavaScript | AWS

Jan. 2024 - March. 2023

IoT-Based Smart Lock and Environmental Monitoring System Developed an IoT smart lock system with environmental monitoring using ESP32.

- Enabled remote locking/unlocking via WebSocket and real-time sensor data exchange.
- Integrated temperature, humidity, dust, and sound detection sensors.
- Utilized FreeRTOS for efficient dual-core task management.
- · Sent data to a remote server via HTTP API for analysis.

Technologies used: ESP32, WebSocket, HTTP API, FreeRTOS, Sensor, C/C++

Sept. 2024 - Jan. 2025

Real-Time Object Detection with OpenCV and SFTP Upload

- Developed a real-time object detection solution using OpenCV and MobileNet SSD on NVIDIA Jetson. • Developed a real-time object detection solution using OpenCV and MobileNet SSD on NVIDIA Jetson.
- Captured multi-camera video streams and performed real-time object detection.
- · Annotated images and stored them securely.
  - Automated image transfer to a remote server via SFTP.
- Optimized performance with CUDA and TensorRT on Jetson.

Technologies used: Python, OpenCV, TensorRT, JetPack SDK, CUDA, SFTP, GitHub, Scrum

French: Fluent | Spanish: Basic

**TECHNICAL SKILLS** 

**Programming Languages:** C/ C++(Expert), Python, JavaScript ,Java

Frameworks & Tools:

O INTERESTS

Node.js, Bootstrap, React, Laravel ,STM32CubelDE, PlatformIO

**Embedded Systems:** 

STM32, ESP32,,ESP8266 ,Raspberry Pi, FPGA (VHDL, Quartus), Nvidia jetson, ATtiny85, ARM Cortex-M, Nordic nRF52

Zigbee, NB-IoT, LTE-M

Cloud Computing & Edge Al AWS, Huawei Cloud, Google Cloud IoT, Edge

Impulse, TinyML, TensorFlow Lite ,NVIDIA JetPack SDK

**Operating Systems:** 

Linux (Ubuntu), Windows

**Version Control Tools:** Git, Github, GitLab

**Networking & IoT Protocols:** 

LoRa, MQTT, , WebSocket, Modbus,

German: Basic

CAN, SPI, I2C, UART, Bluetooth LE,

**Testing & Debugging:** 

Oscilloscope, Logic Analyzer, JTAG Debugger

/olontariat :

Club SMARTECH | Ras Jebal Youth Science Association | Club Alchemist



**LANGUAGES** 

rabic: Native

CONTACT

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English: Fluent





