Houssem Eddine Sfaxi

Embedded software developer

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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

Mars 2023 – Present **Embedded Software Developer (Freelancer)**

- Developed drivers and low-level software for microcontrollers (STM32, ESP32).
- Implemented real-time communication protocols and optimized system performance.
- Integrated IoT solutions with cloud platforms for data management and analytics.

October 2023 – Present **Robotics Trainer**

Creative minds , Ras jebel young science association , Club Smartech

- Conducted robotics and programming workshops for young students.
- Designed interactive projects integrating Arduino, sensors, and motor control.

July2023 – Mars 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**

Développement de lunettes intelligentes pour l'assistance aux personnes malvoyantes

- Développement d'un modèle de détection d'objets avec TinyML et Edge Impulse sur ESP32-CAM.
- Implémentation d'une synthèse vocale (TTS) sur ESP32 DevKit pour descriptions audio en temps réel.
- Optimisation de la reconnaissance avec FOMO (MobileNet V2) et intégration des résultats via Arduino IDE.
- Conversion et diffusion des fichiers audio via GPIO ESP32 et un haut-parleur.

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**

Développement d'un serveur WebSocket pour la gestion en temps réel des appareils IoT

- Gestion des connexions et synchronisation automatique des appareils.
- Transmission de mises à jour en temps réel aux clients web.
- Architecture évolutive et sécurisée pour l'intégration de multiples appareils connectés.

Technologies used : Node.js | Express.js | WebSocket | JavaScript

Jan. 2024 – Mars. 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 sensors for temperature, humidity, dust, and sound detection.
- 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, DHT22, Arduino IDE, C/C++

Sept. 2024 – Jan. 2025 **Real-Time Object Detection with OpenCV and SFTP Upload**

Développement d'une solution de détection d'objets en temps réel avec OpenCV et MobileNet SSD sur NVIDIA Jetson.

- Capture de flux vidéo multi-caméras et détection d'objets en temps réel.
- Annotation des images et stockage local sécurisé.
- Automatisation du transfert des images via SFTP vers un serveur distant.
- Optimisation des performances avec CUDA et TensorRT sur Jetson.

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

TECHNICAL SKILLS

Programming Languages :
C, C++, Python, JavaScript ,Java

Operating Systems:
Linux (Ubuntu), Windows

Embedded Systems:
STM32, ESP32, Raspberry Pi, FPGA (VHDL, Quartus) ,Nvidia jetson

Cloud Computing:
AWS (EC2, S3), Huawei Cloud

Networking & IoT Protocols:
MQTT, LoRa, HTTP/HTTPS, SFTP , WebSocket

Gestion de version :
Git, Github

Frameworks & Tools:
Node.js, Bootstrap, React, Laravel

Testing & Debugging:
Oscilloscope, Logic Analyzer, JTAG Debugger

INTERESTS

Volontariat : Club SMARTECH | Ras Jebal Youth Science Association | Club Alchemist

LANGUAGES

Arabic : Native | **English :** Fluent | **French :** Fluent | **Spanish :** Basic | **German :** Basic