

HAMZEH BOUZEID

Senior Embedded Systems Engineer & IoT Specialist

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PROFESSIONAL SUMMARY

Innovative Embedded Systems Engineer with 8+ years of experience specializing in IoT device development, secure communication protocols, and embedded software optimization. Proven track record of developing over 400 microcontrollers for IoT applications with a focus on security, performance, and power efficiency. Expert in C/C++ programming with strong skills in system architecture, real-time operating systems, and cloud integration. Passionate about mentoring junior developers and delivering high-quality solutions that exceed client expectations.

TECHNICAL SKILLS

****Programming Languages:****

- Advanced C/C++ (Embedded C/C++, Modern C++14/17/20)
- Python for IoT data processing and automation
- Rust (for memory-safe applications)

****IoT & Embedded Systems:****

- Microcontroller Architectures (ARM Cortex-M series, ESP32, STM32)
- Real-Time Operating Systems (FreeRTOS, Zephyr)
- Low-Power Design & Energy Optimization
- Embedded System Security (Secure Boot, TPM, SBOM)
- Sensor Integration & Signal Processing

****IoT Communication Protocols:****

- Network Protocols: LoRaWAN, Bluetooth 5.x/BLE, ZigBee, Wi-Fi 6
- Data Protocols: MQTT, CoAP, AMQP
- Security Protocols: TLS/SSL, DTLS

****Cloud & Edge Computing:****

- Google Cloud IoT
- Edge Computing Solutions
- Fog Computing Architecture
- Data Analytics & Visualization

****Development Tools & Methodologies:****

- Version Control Systems (Git)
- CI/CD for Embedded Systems
- Agile/Scrum Development
- Automated Testing & Continuous Integration
- OTA Update Systems

****Industry Standards:****

- Autosar
- IoT Security Frameworks
- Hardware-in-the-Loop Testing

PROFESSIONAL EXPERIENCE

Senior Embedded Systems Engineer

****Trysens, Lebanon**** | June 2017 – Present

IoT Device Development & Optimization

- Architected and developed 400+ microcontroller-based IoT devices worth \$1.3M using modern C++ and industry-standard protocols
- Implemented secure data transmission protocols between 200+ IoT devices and cloud servers, achieving zero security incidents
- Optimized critical code paths in embedded systems, improving processing speed by 27% while maintaining code quality
- Developed low-power consumption algorithms extending IoT device lifespan by 8 years, significantly reducing maintenance costs
- Created a cross-platform embedded systems library compatible with 6 microcontroller architectures, enhancing development efficiency

Software Quality & Security

- Wrote 29,000 lines of documented embedded C++ code achieving a clarity rating of 95%, facilitating easier maintenance
- Resolved 500+ critical bugs in embedded system code, preventing potential device malfunctions and improving reliability
- Developed integration tests for embedded system modules, achieving 100% code coverage and ensuring robust performance
- Identified and mitigated potential security vulnerabilities, reducing security incidents to 0% and protecting sensitive data
- Performed code reviews identifying and resolving 100% of coding errors in less than 24 hours

System Integration & Performance

- Automated the build and deployment process, reducing deployment time for clients by 8 days and streamlining operations
- Implemented a new memory management system, improving application performance by 20% and optimizing resource usage
- Integrated third-party libraries improving functionality and reducing development time by 30%
- Developed 30 applications for IoT devices ensuring efficient communication with servers and reliable data transmission
- Designed and executed a data compression algorithm, reducing storage requirements by 60TB and optimizing data management

Team Leadership & Collaboration

- Collaborated with 5 engineers to integrate hardware and software components for IoT systems, ensuring seamless operation
- Mentored 3 junior developers on embedded C++ and microcontroller programming practices, accelerating their skill development
- Presented technical concepts and progress to stakeholders achieving a satisfaction rating of 98%
- Collaborated with product managers on delivering 100% of projects ahead of planned schedules
- Worked with designers on improving UI/UX leading to a 27% increase in user engagement

C++ Programming Instructor

****Jinan University, Lebanon**** | September 2016 – June 2017

- Designed and delivered 120+ C/C++ programming lessons tailored to various learning styles, focusing on embedded applications
- Provided 50+ differentiated assignments and projects to promote deep understanding of programming concepts
- Administered 40 assessments to evaluate learning and provide feedback for improvement

- Collaborated with a curriculum team of 13 teachers to develop and enhance coding courses for computer science students

EDUCATION

****Bachelor's Degree in Telecommunications and Informatics****

ULF University, Lebanon | September 2015 - June 2019

CERTIFICATIONS & TRAINING

- Cybersecurity Analyst Certification from IBM (07/2015)
- Technical License in Electronic Industrial from IPNET Institute (06/2023)
- Advanced IoT Security Certification
- Cloud-Based IoT Solutions Architecture

LANGUAGES

- Native Arabic speaker
- Highly proficient in English (Professional working proficiency)

ADDITIONAL SKILLS

- Highly proficient in Microsoft and Google productivity tools
- Experience with simulation and testing frameworks for embedded systems
- Knowledge of AI/ML integration with IoT applications
- Familiar with digital twin technology for IoT device monitoring