Aldana Melani Correa

Embedded Software Developer (C / C++)

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PROFESSIONAL PROFILE

Mid-Level Embedded Software Developer with experience in safety-critical medical systems and IoT. Strong background in C/C++ firmware development on ARM-based platforms, using QNX RTOS and embedded Linux. Contributed to the development of real-time control systems for medical ventilators, integrating low-level logic, Qt/QML-based user interfaces, and system-level debugging.

WORK EXPERIENCE

Software and Firmware Developer *Apr 2023 – Present*
TECME S.A. – Argentina

- Developed and maintained mission-critical firmware (IEC 62304 compliant) in C/C++ for a medical pulmonary ventilator, managing high-reliability tasks on QNX RTOS.
- Implemented real-time control logic (sensor reading, actuator control) and critical alarm systems using C++ Finite State Machines (FSMs) for various ventilation modes.
- Designed, implemented, and maintained low-level C drivers for the Toradex i.MX6 Quad Core (ARM Cortex-A9) platform, interfacing with peripherals (I2C, SPI, ADC) and participating in board bring-up.
- Integrated Qt/QML-based HMI with C++ control backend, establishing communication API for real-time data visualization and alarm propagation.
- Developed and maintained robust unit testing suite (GoogleTest/CppUnit) for C++ modules, ensuring code quality, reliability, and regression-free development.
- Automated software internationalization (i18n) pipeline by developing Python scripts consuming AI-based translation APIs for UI strings.
- Developed code-generation (scaffolding) tools in C++ and Python to auto-generate system parameters and boilerplate code, ensuring consistency with MVVM architecture.
- Performed system-level debugging, including UART/RS-232 communication analysis.

Firmware Developer *May 2021 – Jun 2022*
RUF – Functional Utility Robotics – Argentina

- Developed firmware for smart plugs designed for remote security monitoring via cameras.
- Established communication between companies and international technicians to streamline microcontroller development and research.
- Designed solid programming and flashing structure for multiple microcontrollers (ESP12, ESP32, ESP8266, RTL) using C/C++, Espressif SDK, and RTOS.
- Created technical business documentation for each process; managed version control with GitHub/GitLab using Scrum methodology.

Research & Development Intern *Mar 2021 – Dec 2023*
UTN – National Technological University – Argentina

- Developed electrical measurement equipment with remote communication and real-time data transmission for residential power networks.
- Used embedded systems tools (ESP microcontrollers) with power, current, and voltage sensors.
- Achieved optimization, efficiency, and energy control monitoring for the final product.

EDUCATION

Electronic Engineering   2019 – 2024
National Technological University (UTN) – Córdoba, Argentina
In progress

   Software Engineering   2024 – Present
Universidad Siglo XXI – Argentina
In progress

SKILLS & COMPETENCIES

Programming:
- Advanced C++ Programming and Design Patterns
- Multi-threaded and Concurrent Programming
- Performance Optimization and Profiling
- Cross-platform Development (Windows, Linux)

Professional:
- Agile and Scrum Methodologies
- Code Review and Mentoring
- Problem-solving and Analytical Thinking
- Effective Communication and Collaboration

CERTIFICATIONS

- **QNX Real-Time Operating System** – BlackBerry QNX
- **Object-Oriented Programming in C++** – Udemy
- **Implantable Electronic Devices and Medical Applications** – EAMTA (Argentina School of Micro-NanoElectronics, Technology and Applications)
- **Kali Linux for Ethical Hacking** – Udemy
- **Advanced C Programming** – Noble Work Foundation