

Ali Yaghoobi

Embedded Software Engineer

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Summary

Embedded software engineer with 9+ years of experience in developing and delivering innovative solutions for a variety of industries including industrial automation, smart home, IIoT, and medical devices. Proven ability to design, develop, test, and deploy embedded firmware and software applications, both independently and as part of a team.

Skills

- Programming languages: C, Python, C#
- Microcontrollers: STM32, AVR, ESP32, 8051
- Databases: Microsoft SQL Server, MariaDB
- SCADA and IoT: COPA-DATA Zenon, SIMATIC WinCC, OPC UA
- Protocols and technologies: CAN, Modbus, MQTT, Bluetooth, Ethernet, LoRa, Wi-Fi, GSM
- OS and platforms: Windows, Linux, Embedded Linux, FreeRTOS

Experience

Senior IoT Developer

Amitco -Middle East Mines and Minerals Industries, Kerman, Iran — January 2021 - Present

- Designed hardware and developed firmware for the vehicle data network (CANBUS) logger optimized for mining dump trucks: captures all messages, intelligently reduces size (through thresholds and timing), and transmits selectively (via WiFi/3G). Enables proactive maintenance by pinpointing root causes and significantly slashing costs.
- Secured OPC Data Collector, extracted critical process data using advanced filters, optimized real-time updates in MariaDB. Dual-layer encryption (PGP Over IPSEC) ensured secure AI server transmission and data compliance. (OpenWrt, C, Python, MariaDB)

Embedded Firmware Developer

Koosha Hooshmand Kerman, Kerman, Iran — June 2015 - January 2021

- Developed secure & scalable RFID water Water Dispensing System(GPRS, Mifare Rfid, GUI interface) for 40+ stations, achieving 30% waste reduction through real-time data & remote control (API), enhancing efficiency & user experience.
- Designed hardware and PCB layout for Compact RTU Based on STM32 with isolated Rs485, analog input, and Ethernet interface. (Altium Designer)
- Developed MQTT Gateway hardware & firmware to integrate Modbus networks with MQTT, enabling real-time data exchange and improved device interoperability
- Developed & deployed 4 SCADA systems(Zenon)for water companies, optimizing DNP3/Modbus/Profibus integration. Improved efficiency& reliability with comprehensive reporting, alarms, data archives, & modern GUI.

- Developed Ethernet-connected Digital I/O device (8DI, 8DO, 2AI, 2AO) for industrial signal exchange over IP. Enables seamless exchange of analog & digital data (max 8 digital pairs, 2 analog pairs) with another device or a local PLC/DCS, achieving low latency ($\leq 20\text{ms}$) on local networks. Web interface allows for configuration.

Relevant Projects

- Designed IEC 61000-4-3, IEC 61000-4-6, and IEC 61000-4-8 compliant hardware and PCB for Portable Syringe pump. (Altium Designer)
- Developed secure and configurable Modbus Slave firmware for 4-channel Thermocouple data acquisition, streamlining temperature monitoring..
- Designed versatile General Transducer firmware (Modbus Slave) with high-resolution data acquisition (3x 24-bit ADC) and flexible analog output control (4x 16-bit DACs) for various sensors, generating 4-20mA, 0-10V, +/-10V ranges.
- Developed firmware for battery-powered portable syringe pump with user-friendly GUI (bilingual) for selecting injection type, duration, and syringe type. Features dual self-calibration mechanisms and multi-layered protection compliant with medical standards.
- Developed firmware and designed hardware/PCB for an enhanced water well inspection camera. It integrates a shaft encoder for real-time depth measurement and an on-screen display (OSD) for key information, improving efficiency and accuracy of inspections.
- Developed a high-precision water quality monitoring system for deep wells, utilizing Direct Digital Synthesis (DDS) technology to generate a precise sine wave for accurate TDS measurement.
- Designed hardware and developed firmware for Queue management kiosk, reducing customer wait time and improving efficiency (JAVA, C#, AVR).
- Developing low-power, battery-powered data acquisition devices using LoRa for diverse sensors (Thermocouple, RTD, 4-20mA), transmitting data to a receiver with 4-20mA//Modbus RTU conversion. Firmware in development focuses on efficient communication and sensor integration.
- Developed an 8-channel AC dimmer specifically designed for Smart Homes, featuring Modbus RTU communication for seamless integration into existing automation systems.

Education

- Bachelor of Electronic Engineering, Besat University, Kerman, Iran, 2010
- Associate Degree of Electronic Engineering, Sahid Chamran University, Kerman, Iran, 2008

References

Available upon request.