Alexander Ross, P. Eng

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Summary

Experienced professional engineer with a strong background in developing and optimizing systems across firmware, hardware, and software. Proven track record of leading teams, solving complex problems, and bridging the gap from business to technology.

Work Experience

Ashored Innovations, Lead Computer Engineer (Promoted from Electronic Design Engineer), May 2020 - Present

Providing technical leadership and design implementations for the software and hardware teams for flagship products. Heavily involved in the overall design, field testing, customer and enforcement interactions, and industry strategy.

- Responsible for architecting and executing the development of in house developed acoustic low power MFSK communication stack in portable C code. Leveraging peripherals such as DMAC, ADC, interrupts, event sub systems, and hardware timers to fully deliver a robust, energy efficient solution. Performing digital signal processing and data analysis in Python for algorithm and signal process refinements.
- Successfully implemented a robust cloud backend infrastructure leveraging AWS services such as Cognito, AppSync (GraphQL), Lambda, GitHub Webhooks for streamlined management across development, staging, and production environments, along with RDS (MySQL) integration.
- Integrated Nordic's Bluetooth Low Energy hardware to the products. Developed features as onboard/overboard detection, over the air updates, mesh communications, failure states, data logging, sensor communications, device provisioning, charging/battery management, and low power sleep modes.
- Contributed to the hardware design including the schematics for the microprocessor pin assignments, release magnet/sensing system, transformer winding calculations, board bring up, manufacturing procedures and assisting with the analog receive chain development.
- Spearheading the development of functional test scripts for feature and board validation using an in-house C# test tool complete with BLE device communications from the test PC and mock frontend features such as over the air firmware transfers.
- Providing requirements and proof of concept frontend features in Flutter, particularly focusing on backend, BLE communications and hardware interactions. Oversaw implementations of flexible testing frameworks for full stack validation.

NewAE Technologies Inc., Senior Embedded Engineer, October 2019 - March 2020

Designing embedded software and FPGA based solutions for various security tools with devices focused on vulnerability exploitation.

- Designed and implemented an XY Motor Driver utilizing FreeRTOS on Atmel SAM3U, integrating GCODE functionality for external USB position control to precisely target physical sections of the processor for EMF pulse attacks.
- Successfully ported the core flash transfer logic of a trusted firmware bootloader to the ARM STM32F303 and provided updated driver and compilation flags as required. Repeated sequencing of the process for glitch attacks was supported by a companion Python script that provided USB communications for bootloader transfers.
- Provided customer support through online forums and custom code for user applications.

KSR International, Automotive Software Engineer (Promoted from Junior to Intermediate), May 2016 - October 2019

Member of the development team for an integrated belt alternator starter, an ATV electronic power steering unit, software lead for a steering angle sensor and a smart thermal management valve controller. Compliant to ISO 26262

- Contributed to an Integrated Belt Alternator Starter, incorporating CAN layer functionalities in C and test tools to ensure requirements are met such as a generator that parses and or generates DBC CAN message frames in C#.
- Played a pivotal role in Electronic Power Steering projects, focusing on torque-sensing firmware development, comprehensive testing, and integration of Unified Diagnostic Services (UDS) features.
- Lead the software efforts for Steering Angle Sensor and a Thermal Management Valve Controller, overseeing scheduling, architectural design, fault management, motor controller, angle sensing, and communications.
- Contributed to the Electronic Hydraulic Power Steering system, enhancing CAN features and fault modules for required functionality.

Education

University of New Brunswick, Class of 2016, *Bachelor of Science in Computer Engineering*

VP of Electronics for Robotics Club

1st Place in Senior Engineering Capstone Software Category, 2015