Kevin Nause

Firmware Engineer II

Contact

425.626.7520

kevin@nause.engineering
linkedin.com/in/kevinnause
github.com/Nauscar

Programming

C, C++, Java, C#,
x86 & ARM Assembly,
Python, JavaScript

Frameworks

OpenCL, OpenMP,
Hadoop, Thrift,
Qt, ASP .NET

Interests

Digital Photography,
Performance Vehicles,
Homebrewing

About

I enjoy low level programming on platforms such as embedded systems and operating systems. Working on wearable hacks and obtaining root access on mobile devices are also side interests. Computer security and logical analysis are key interests of mine.

I have been a Linux enthusiast since I typed ”Hello World” for the first time and have adored penguins ever since. The first thing I do when I sit down at a computer is change the keyboard layout to Dvorak and plug in a keyboard that is older than myself: the IBM Model M.

Education

Sep 2011 – Apr 2016 — **Bachelor of Applied Science (B.A.Sc.)** — University of Waterloo
Computer Engineering

Experience

Jul 2016 (to Present) — **Microsoft** — Redmond, Washington
Firmware Engineer II

- Working on embedded controllers for platforms with Intel CPUs and Nvidia GPUs
- Experience with power rail sequencing, battery fuel gauges, and thermal subsystems
- Implementing inter-bus communications via USB, UART, SPI, I2C, SMBus
- Working with communication protocols such as TCP/IP, HID, RS-232
- Proficient with oscilloscopes and logic analyzers
- Experience with schematics, reference manuals, and errata for hardware peripherals

Products: Surface Hub, Surface Laptop
Hardware: NXP/Freescale K22 ARM Cortex-M4
Languages Used: C, ARM Assembly, C#, PowerShell

Aug 2015 (5 months) — **Pebble Technology** — Kitchener, Ontario
Embedded Firmware Engineer

- Implemented and debugged device drivers, recovery firmware, and system applications on the Pebble OS (based on FreeRTOS)
- Primary focus was porting the current firmware to an older device with significantly less flash storage and a black and white screen
- Optimized anti-aliasing on 8-bit displays, and dithering on 1-bit displays
- Debugging using GDB and disassembler

Products: Pebble, Pebble Time, Pebble Time Round
Hardware: STM32F4 ARM Cortex-M4, STM32F2 ARM Cortex-M3, TI CC2564 Bluetooth Controller, Bosch BMI160, LIS3DH, Sharp LS013B7DH01 Memory LCD, JDI memory LCDs
Languages Used: C, ARM Assembly, Python

Jan 2015 (4 months) — **Motorola** — Kitchener, Ontario
Security Engineer

- Discovered and patched vulnerabilities, resource leaks, and concurrency problems in Android OS, Motorola’s MSM kernel, and Moto X sensor hub
- Used static analysis to assist in discovering security vulnerabilities
- Traced execution flow to isolate false positives or potential exploits

Products: Moto E/G/X, Moto 360
Hardware: TI OMAP 3, Qualcomm PM8921 PMIC, NXP 44701 NFC
Languages Used: C, C++, Java

Sep 2014 (8 months)
Computer Aided Reasoning Group — Waterloo, Ontario
Undergraduate Research Assistant, Unviersity of Waterloo
- Reported to Professor Vijay Ganesh
- Researched the topic of SAT solvers and their underlying heuristics
- Primary focus involved the relevance of backdoor variables and community structure for the VSIDS decision heuristic
- Experience with static analysis, symbolic execution, and Return Oriented Programming (ROP)

Languages Used: C, C++, x86 Assembly, Java

May 2014 (4 months)
ON Semiconductor — Waterloo, Ontario
Embedded Tools Developer
- Designed Bluetooth Low Energy GATT services for functions such as data streaming, audio streaming, and status updates
- Embedded programming with BLE enabled medical devices such as hearing aids, insulin monitors, and heart rate monitors
- Interfaced with Windows and Android client devices

Hardware: Nordic nRF51822 Bluetooth Low Energy Controller, ARM Cortex-M0
Languages Used: C, C++, Java, ARM Assembly

Sep 2013 (4 months)
eSolutionsGroup — Waterloo, Ontario
Mobile Developer
- Designed a real-time transit prediction system using GTFS data and protocol buffers
- Database design, MVC server communications, and mobile application development

Languages Used: C# (ASP .NET), SQL, JavaScript

May 2012 (16 months)
Regional Municipality of York — Richmond Hill, Ontario
Transit Management Systems
- Worked with GTFS data and real-time prediction feeds and contributed to the OneBusAway project
- Hands on work with transit embedded systems and fare management systems

Languages Used: C#, Java

Projects

Sep 2015
Automated Home Brewery System — Brew It Yourself
The objective of this project is to combine homebrewing experience with engineering design, and construct a single vessel brewing system. By maintaining a strict control of key parameters, the brewing process is regulated using a combination of fluid mechanics, heat transfer, digital controls, power systems, embedded robotics and mobile development. For more information please see the Design Overview on GitHub.

Jan 2014
Myo DSLR Control — Thalmic Labs
After being accepted into Thalmic Lab's alpha test program, this project focused on creating an interface between the Myo armband and an Arduino to control the shutter of a DSLR via the remote trigger pin-out and an IR sensor. This concept was than expanded to utilize TCP/IP communications in order to control the camera's shutter at even greater distances and remote locations.