Kevin Nause
Firmware Engineer

Contact

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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.)
Computer Engineering

University of Waterloo

Experience

Jul 2016
to Present

Microsoft

Redmond, Washington

Firmware Engineer
- Working on the embedded controller for platforms with Intel CPUs and Nvidia GPUs present
- 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 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 Accelerometer/Gyroscope, LIS3DH Accelerometer, Sharp LS013B7DH01 Memory LCD, JDI memory LCDs (round/square)
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

| 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, 32-bit ARM Cortex-M0 MCU
Languages Used: C, C++, Java, ARM Assembly

| Sep 2014 (8 months) | **Computer Aided Reasoning Group** | Waterloo, Ontario |

Undergraduate Research Assistant, Unviersity of Waterloo
- Report 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

| Sep 2013 (4 months) | **eSolutionsGroup** | Waterloo, Ontario |

Mobile Developer
- Designed a real-time transit prediction system using GTFS data and protocol buffers
- Configured database, and server communications using MVC
- Mobile development for client side application

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

| 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.