Kelvin Ly

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University of Central Florida — PhD, Computer Engineering

Cummulative GPA: N/A — 2016-

University of Central Florida — BSEE, Electrical Engineering

Cummulative GPA: 3.905, Magna Cum Laude — 2011-2015

Professional Experience

University of Central Florida Undergraduate/Graduate Research, Orlando Fl — November 2015-

The focus on my research here has been on the security of the **Internet of Things**, more specifically the development of defenses for IoT devices against attacks. Consequently, much of my work so far has been in **PCB design and assembly** to develop devices to test out security ideas or provide education on hardware security. Designs so far have incorporated **MSP430** and **Atmel** microcontrollers, and work is on a new design incorporating the **CC3200** Wifi SoC.
I have also previously worked on our submissions for the **NYU CSAW Embedded Security Competition** '15 and '16 (winning second and first respectively), which involved the development of **Verilog** code in **cryptography and security domains**; the first competition involved development a cracker for an election system using homomorphic encryption, the second competition involved modifying an **OpenRISC** processor core to improve security, with matching changes to a **GCC backend** to allow our security checks to be automatically injected into user land code.

University of Central Florida Undergraduate Researcher, Orlando FL — December 2014 - March 2015

This research experience actually has had so far two major projects. The first phase was focused on Working on a **RAVEN II** medical robot running the **ROS C++** robotics framework. This robot was meant to work as surgery robot, with our task being to augment the controls with BCI-based controls to improve usability. Unfortunately the robot proved hard to use, and we switched over to working in **signal processing** in **Python** of EEG data in general. Our team has been studying **feature extraction** and **SSVEP frequency detection** to hopefully advance the state of the art. We have used **emokit Python** library to extract signals from Emotiv EEG headset.

Internships

IBM Extreme Blue Intern, RTP NC — May 2015 - August 2015

Here our team worked on zero knowledge **encryption** for **IBM Connections Cloud**. We were the pioneering efforts at this, producing a proof of concept to pave the way for the actual Connections team to develop. We used **JavaScript and Node.js** for the server **backend**, and modified and used existing **Java** and **Python** code and libraries for various parts of the project. Our team was organized around modern programming practices, working in an **agile** team of four, with heavy emphasis on **test coverage** and **unit testing**.

Google Software Engineer Intern, Chapel Hill NC — May 2014 - August 2014

Here I worked as an intern on the Skia benchmarking team, worked on benchmarking framework for **Skia** rendering engine team. I learned **Go**, and contributed code in **C++**, **Python**, and **Go** for both internal and open source projects. This job involved pipelining the gigabytes of data being produced daily from test bots into a useful visualization for the Skia team.

Projects

- **UCF Lunar Knights** project, electrical/communications teams
  - Helped with **wireless communication** with **Beaglebone Black**
  - **UART** communication with **Arduino** to send **PWM** to motor controllers
  - Helped in robot assembly, troubleshooting and debugging
  - Developing software for **robot simulation and testing**, mainly through providing wrappers in **ROS** for **gazebo**
- Senior design project
  - **Hardware system design** for all components
    - Led overall hardware system design
    - Designed schematics for all components using **KiCAD** EDA software
    - Converted schematics into PCBs using **KiCAD**
  - Research into **signal processing** for **feature extraction** with respect to applications in **brain-computer interfaces**
  - Created and designed laser cut design to create gimbal to control wheelchair joystick
  - Wrote **assembly** for the **MSP430** to test the gimbal

Skills

- Hobbyist experience with eletronics design and reverse engineering, guitar electronics repair
- Fluent in **C/C++**, **Python**, **Go**, **Verilog**
- Working knowledge of **x86/x64/MIPS/MSP430** assembly, **Java**, **LaTeX**, **bash**, **MATLAB Kicad EDA** Software Suite, **Multisim**, **Xilinx ISE**
- GitHub user: `https://github.com/cactorium`