

# Kelvin Ly

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UNIVERSITY OF CENTRAL FLORIDA

Cummulative GPA: 3.944

MS, COMPUTER ENGINEERING

2016-2018

UNIVERSITY OF CENTRAL FLORIDA

Cummulative GPA: 3.905, Magna Cum Laude

BS, ELECTRICAL ENGINEERING

2011-2015

## OBJECTIVES

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To begin and pursue a career in electronics engineering or firmware engineering

## SKILLS

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- Professional experience in electronics design (mostly **mixed signal/digital**, a little RF), **PCB layout** (KiCad, Altium Designer)
- Hobbyist level **PCB assembly and soldering**, **SPICE circuit modeling**, and reverse engineering
- Some familiarity with **I2C, SPI, UART, CAN, SDIO, Ethernet(10BASE-T), on-off keying, PCM, 802.11a/b, MIPI CSI, parallel camera interface, JESD204, SerDes**
- Implemented **I2C, SPI, UART, PWM, VGA, Ethernet RMII** communication using FPGA logic (from scratch, clean room implementations from standards)
- Fluent in **C99, C++14, Python 2/3, Go, Verilog**
- Working knowledge of **x86/x64/MIPS/MSP430** assembly, **Java, LaTeX, MATLAB, Multisim, Xilinx ISE/Vivado, VHDL, Linux** (scripting and low-level userland programming, some kernel module programming), **JTAG/SWD**

## PROFESSIONAL EXPERIENCE

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**STERIS IMS** ELECTRICAL ENGINEER, COOPER CITY FL

MAY 2018 - PRESENT

- Created **PCB designs, layouts**, sourced parts, and **assembled and tested** PCBs to create reproducible and manufacturable designs, including some **flexible PCBs**
- Developed **firmware** and **support software** for devices and prototype designs as needed, including work in **image processing** using **OpenCV**, and **IMU sensor fusion** using industry-standard **Madgwick filter**
- Tested devices to ensure compliance with **IEC60601** and other standards

**Cassina Technologies** SOFTWARE ENGINEER, COOPER CITY FL

OCTOBER 2018 - PRESENT

- Developed **firmware** for Bluetooth LE-based device and designed **Bluetooth LE application level communication protocols** to use in device
- Developed **Android app** to interface with and to control Bluetooth LE-based device

**Fluorometric Instruments** DESIGN ENGINEER, ORLANDO FL

SEPTEMBER 2017 - PRESENT

- **Designed PCBs** part time for oxygen sensors, allowing client to test manufacturable products
- Created **designs, layouts**, sourced parts, and **assembled and tested** PCBs to create reproducible and manufacturable designs
- Developed **firmware** and **support software** for devices as needed

**University of Central Florida** UNDERGRADUATE/GRADUATE RESEARCHER, ORLANDO FL

NOVEMBER 2015 - MAY 2018

- Researched defenses and attack mitigations for the **Internet of Things**, producing four publications and one book chapter
- **Designed and assembled PCBs** for the lab, producing tools and prototypes for a wide variety of projects
  - Built mixed-signal or digital designs incorporating **Texas Instruments, Expressif, and Atmel** microcontrollers
  - Designed **architecture and IP cores** for **Nexys 4 Artix-7 FPGA** to transceive **Ethernet packets** and **crack homomorphic encryption** as part of our second place entry in **NYU CSAW ESC '15**
  - Designed IP cores in **Verilog** to patch **OpenRISC processor core** as part of our winning entry in **NYU CSAW ESC '16**

**University of Central Florida** UNDERGRADUATE RESEARCHER, ORLANDO FL

DECEMBER 2014 - MARCH 2015

- Studied **feature extraction** from EEG data, implementing **SSVEP frequency detection** that was later used in senior design project
- Maintained and repaired **RAVEN II** medical robot running on **ROS robotics framework**, restoring it to operation and allowing its use under a new team in current research projects

## INTERNSHIPS

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**IBM** EXTREME BLUE INTERN, RTP NC

MAY 2015 - AUGUST 2015

- Developed **on-disk encryption** for **IBM Connections**, creating a roadmap of design pitfalls for IBM's teams to work off of
- Implemented project in **JavaScript and Node.js**, with patches to existing **Java** and **Python** code and libraries, successfully providing encrypted context access and search indexing

**Google** SOFTWARE ENGINEER INTERN, CHAPEL HILL NC

MAY 2014 - AUGUST 2014

- Patched existing benchmarking code for Skia rendering engine, allowing collection of gigabytes of data per day into a single database
- Contributed code in **C++**, **Python** and **Go** to create actionable visualizations of benchmarking data, fulfilling Skia team's recommendations

## NOTABLE PROJECTS

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- **UCF Lunar Knights** project, Software team lead Fall 2017-Spring 2018, member since 2015 (Martian robotic mining competition)
  - **Troubleshoot and debugged** previous year competition robots, tuning and refining PID controller values to allow responsive robot movement and prevent physical damage to robot frame
  - Designed **CAN interfacing board** with **high density connectors** to mate with Nvidia's Jetson TX2, allowing native **CAN bus** access
  - Developing software for **robot simulation and testing** using **ROS** and **gazebo**, allowing parallel development of autonomy and robot assembly
  - Developing software systems for **robotic autonomous navigation** and teleoperation, allowing robot functionality for all years of competition
- Senior design project (mind-controlled wheelchair)
  - Led high-level hardware system design
  - Designed and layed out circuits for all high-level modules using **KiCAD** EDA software
  - Research into **signal processing** for **feature extraction** with respect to applications in **brain-computer interfaces**
- Capacitance-based linear encoder (<https://github.com/cactorium/linear-sensors>)
  - Designed low-noise electronics to amplify and filter weak capacitively coupled signal capable of repeatable measurements to within approximately 0.01 mm
  - Developed **bare metal ARM firmware** to **digitally process** signal to capture phase information using **CORDIC**-based algorithms
- Light-based transmitter and receiver pair (part of in progress project)
  - Designed wireless communication using **BPSK** using white LED as transmitter and visible light photodiode as receiver on custom PCBs
  - Developed low noise **transimpedance amplifier** and op amp gain stages to amplify and filter light signal
  - Developed **bare metal ARM firmware** to **digitally process** signal to recover data and send to host across custom implementation of **CDC-ACM USB interface**
  - Developed **low power bare metal MSP430 firmware** to activate based on **capacitive touch sensing** and transmit encoded IMU data across the light-based wireless channel
- Custom universal **motor controller** board, capable of driving brushed DC, BLDC, and stepper motors at 12-18 V, using DI DGD0506A MOSFET **gate driver** with integrate high-side gate bootstrap (part of in progress project)
- 915 MHz 1 Mbps discrete RF transceiver (in progress)
  - Designed transmitter and receiver pair using discrete RF components, including discrete **LNA** and **PA transistor stages**
  - Developing **FPGA logic** for **Lattice ICE40 LP FPGA** to **package and encode/decode data** into/out of wireless packets, interfacing with custom discrete high-speed DAC and ADC