

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

To begin and pursue a career in electrical or software engineering

SKILLS

- Professional experience in electronics design (mostly **mixed signal/digital**, a little RF), **PCB layout** (KiCad, Altium Designer)
- Some experience with **analog filter design**, **digital signal processing**, **image processing** (CUDA interoperating with **OpenCV**), **OpenGL** (**ES 3.0/WebGL**), **Qt**
- Hobbyist level **PCB assembly**, **reflow**, and **rework**, **SPICE circuit modeling**, and reverse engineering (hardware, firmware, protocols)
- Some familiarity with **I2C**, **SPI**, **UART**, **CAN**, **SDIO**, **Ethernet**(10BASE-T), **QAM**, **on-off keying**, **PCM**, **802.11a/b**, **MIPI CSI**, **parallel camera interface**, **JESD204**, **SerDes**, **AMBA/AXI**, **DDR1**, **SPI Flash**, **LVDS**, **Bluetooth Low Energy**, **USB 1.0**, **one wire**
- Familiarity with **nRF52**, **MSP430**, **PIC12**, **ATTiny/ATMega**, **Atmel SAM**, **STM32**, **Silicon Labs C8051** microcontrollers
- Implemented **I2C**, **SPI**, **UART**, **PWM**, **VGA**, **Ethernet RMII**, **parallel camera**, **Wishbone**, **HyperBus**, **MIPI CSI-2** interfaces on FPGA logic (**Lattice**, **Xilinx**, **Altera**)
- Fluent in **C99**, **C++14**, **Python 2/3**, **Go**, **Verilog**, **Rust**, **Haskell**
- 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**, **TCL**, **SystemVerilog**, **JavaScript**, **TypeScript**, **WebAssembly**

PROFESSIONAL EXPERIENCE

STERIS IMS ELECTRICAL ENGINEER/SENIOR 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 **FPGAs**, and **IMU-based sensor fusion**
- Developed **custom kernel driver** for **Jetson TX2** to support custom camera sensor
- **Reverse engineered** various PCBs, serial protocols, etc
- 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
- Updated existing software written in **C#** to add new features
- 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** and patched **OpenRISC processor core**, **GCC**, and **Linux kernel** 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

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 from
- 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

Project	Software/FPGA	Analog/RF	DSP/Control	Power/Misc
Brass marine spyglass (WIP)	Custom optical simulation/optimization software written based on ray-optics library in Python			Mechanical design with sliding fit components, parts CNC'd on home CNC router
3D printer pick and place attachment (WIP)	Computer vision -based PCB and component semiautomatic registration, interfacing with 3D printer controls for bulk of motion		Stepper-driven theta axis, open loop second Z axis	Multiboard design, lots of mechanical design using FreeCAD , Maxwell kinematic coupling
CNC controller	grbl based CNC driver using TMC2590 stepper motor controllers, ATtiny404 for stepper motor initialization			Four layer PCB layout, careful routing around current sense and MOSFET gate traces, control signal isolation to reduce EMI issues
FPGA-based logic analyzer based on iCE40 devkit	Logic signal encoding using hardware ring buffer , efficient signal encoding, hand written soft UART core			Hand written I2C decoder in Python
Visible light transmitter and receiver	Bare metal ARM coded in C, using USB peripheral for data transfer, MSP430 -based transmitter, signal processing code written in Python	Transimpedance photodiode front end with several stages of variable gain amplifiers and active bandpass filtering	Cortas phase lock loop , software-controlled AGC , BPSK demodulation with CRC checksum, PID-based automatic gain control	Space-constrained, low power transmitter design with capacitive-touch buttons, IMU for position sensing
RF broadband attenuator blocks	-	RF layout , routing taper design to transition from SMA connector to coplanar waveguide on two-layer FR4	-	(WIP) Aluminum housing to reduce RF emissions
144 MHz Yagi-Uda antenna with discrete LNA	LNA designed using Jupyter Notebook , implemented noise calculation code for scikit-rf	Infineon BFU520 based LNA, L-matching networks designed using VNA measurements , antenna tuning and characterization using modified TinyVNA	-	Modified TinyVNA to have lower output power to avoid saturating BFU520 during measurements
Capacitive linear encoder (rev. 1/2)	Bare metal ARM coded in C for STM32F070C5T6	High impedance, low noise front end followed by cascaded active low pass filters into ADC driver	Computationally efficient digital filtering to remove harmonics and phase shift calculation using CORDIC	-
Lunar Knights robotics team software lead (UCF) for NASA Mars Rover Competition	Software written in C++ using ROS framework using NVIDIA Jetson TX2, autonomous navigation and teleoperation	-	PID tuning for wheels and digging arm	Mitigated noise on digging arm position potentiometers, wrote code to interface with CAN-based motor controller
Mind-controlled wheelchair, senior design project (UCF)	Wheelchair controls implemented on Raspberry Pi 3 in Python 3	-	Feature extraction from electrodes on scalp, based on steady state visually evoked potential (SSVEP)	Designed laser cut joystick gimbal