John Harkins

2101 Chestnut St., Apt. 701, Philadelphia, PA 19103
(302) 981-3217 | harkj@seas.upenn.edu
http://jharkins95.github.io | https://www.linkedin.com/in/jharkins95

EDUCATION

Bachelor of Science in Engineering, Computer Engineering, *summa cum laude* May 2018
University of Pennsylvania, School of Engineering and Applied Science Philadelphia, PA
GPA: **3.90/4.00**
Awards: William L. Everitt Student Award of Excellence, Tau Beta Pi and IEEE Eta Kappa Nu Inductee, Dean's List 2014 – 2018
Relevant Coursework: Operating Systems, Real-Time and Embedded Systems, IoT Product Design, Computer Organization and Design, Software Engineering, Data Structures and Algorithms

EXPERIENCE

Course Developer and Teaching Assistant, F1/10 Autonomous Racing May 2018 – present
mLab, Department of Electrical and Systems Engineering, University of Pennsylvania

- Created labs (PID wall following, pure pursuit navigation, speed controller tuning) for new course at Penn in 1/10 scale autonomous racing.
- Developed 100+ page reference manual for building, driving, and developing algorithms for car.
- Gave lectures on internals, usage, and tuning of VESC electronic speed controller.

Teaching Assistant (Embedded Systems, Computer Organization and Design) August 2016 – May 2018
Departments of Electrical and Systems Engineering/Computer and Information Science, University of Pennsylvania

- Developed course materials for undergraduate- and graduate-level embedded systems and computer architecture courses.
- Graded lab assignments and examinations for 150+ students.
- Assisted students in completing homework and lab assignments during lab and office hours.

Hardware/Software Engineering Intern May 2017 – August 2017
Intel Sports Group, Intel Corporation, Santa Clara, CA

- Designed software in Unity for VR/AR sports-related applications, including camera pan/zoom automation and play detection for basketball broadcasts.
- Developed firmware for wearable devices used in human performance and body kinetics applications.
- Documented 1000+ lines of code for protocol to transmit data between smart watch and mobile phone using Blueooth GATT services.

Undergraduate Research Assistant May 2016 – August 2016
mLab, University of Pennsylvania

- Designed circuitry to read pressure-sensitive mat and power array of 12 high-voltage electroluminescent panels for interactive yoga mat applications.
- Wrote embedded serial communication software in C and interfaced microcontrollers with computer to collect pressure data.
- Developed graphical user interface in C++ and Qt to visualize data.

SKILLS

Programming Languages

- Proficient: Java, C
- Working Knowledge: C++, Rust, x86 Assembly
- Some Experience: C#, Python, LaTeX, HTML, Verilog

Hardware Design/Simulation: Xilinx Vivado, Altium Designer, Autodesk EAGLE, CircuitLab
Software Tools/Frameworks: ROS, Unity, Git, IBM Bluemix

PROJECTS

IoT Product Design: Designed bike theft detector using Atmel SAMW25 microcontroller and Wi-Fi module. Includes PCB designed in Altium, custom bootloader written in C that downloads and installs firmware updates when newer versions are available, and remote monitoring via MQTT and IBM Bluemix.
Operating Systems: Developed operating system for class project (PennOS) featuring multiple-priority preemptive round-robin scheduler, flat FAT file system, shell, I/O redirection, and support for daemon processes. One of highest-scoring final projects that semester.
Embedded Systems: Designed programmable breadboard (prototyping board for circuits) capable of generating arbitrary test waveforms and measuring voltage at any point of user's choice.