**Garrett**

**Hagen**

**EXPERIENCE**

**Carnegie Robotics** –Advanced robotics sensors and platforms

*Co-op (Fall 2020)*

* Created and maintained a sizeable C++ framework to provide a simple API and reduce boilerplate code for internal projects that require MultiSense functionality
* Developed and integrated C++ library for colluminated LED backlight panel to be used in MultiSense lens fitting processes
* Created C++ application to assess the quality of extrinsic and intrinsic calibrations for MultiSense cameras using OpenCV, Ceres-Solver, Boost, and GTest
* Developed a modified firmware in C and a GUI in Python to verify the functionality of MultiSense PCBs prior to the start of assembly
* Refactored existing production software to build via Docker and improved dependency handling with CMake

*Co-op (Spring 2019)*

* Developed an extensive testing suite in C++ to verify functionality of MultiSense firmware releases prior to deployment
* Utilized Qt and OpenCV to develop an interactive C++ GUI that demonstrates concurrent left/right grayscale, color, and disparity image streaming on all MultiSense camera models
* Integrated functionality to existing manufacturing software that enforces the use of a specified version using CMake and Git

*Co-op (Summer 2018)*

* Utilized ROS and OpenCV to develop a Python GUI application that simultaneously collects, organizes, and stores data from a diverse set of stereo and depth cameras
* Developed a Python application that utilizes manufacturing’s existing calibration routine to calculate external transforms between various types of stereo cameras
* Developed a tool in Python to package all C/C++ application dependencies into an AppImage, enabling portability across company Linux machines
* Applied computer vision principles to manipulate stereo, depth, and laser data for use in 3D scene construction and modeling

**Gener-8** - FDA approved CPM self-rehabilitation devices

*Software Development and Hardware Design (2016-Present*)

* Designed and integrated system that calculates knee flexion and rotation angle and transmits results in real-time via Bluetooth
* Utilized Firebase and Vidyo API to develop Swift/Obj-C iOS app that communicates with Gener-8 machine via Bluetooth for at live at-home rehabilitation progress monitoring and video chat.
* Developed Swift iOS app that measures human joint angles in real time via TensorFlow pose estimation

**iRevive** – Mobile Phone and Computer Repair

*Founder (2013-Present)*

* Self-taught technician with 175+ successful repairs

**For You Inc** – Manufacturers of Duraband® and other exercise devices

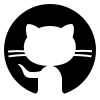
*Product Designer (2012-2015)*

* Designed and received patent for Durabat® baseball training device (used by multiple professional baseball players)

*Founder (2013-Present)*

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347 Highview Rd

Wexford, PA 15090

**EDUCATION**

**University of Pittsburgh** – Main Campus Pittsburgh, PA

BS in Computer Engineering *(Fall 2016 – Summer 2020)*

Pitt Engineering Dean’s Honor List(*Fall 2017- Present*)

***Pitt CoE Coursework***

Data Structures (*Java*), Algorithms (*Java*), Object Oriented Programming (*Java*), Machine Learning (*R*), Operating Systems (*C*), Computer Architecture (*C*), Computer Networks (*C*), Software QA (*Java*), Web Development (*Python, JavaScript, HTML, CSS, SQL, JSON*), Software Engineering (*Java*), Digital Design, Electronic Circuits

***Pitt Math Coursework***

Linear Algebra, Probability and Statistics, Differential Equations, Calculus 1 & 2, Physics 1 & 2



**PROJECTS**

**Biometric Lock** *(2019)* – Developed Swift iOS App that communicates via Bluetooth with Arduino that controls fingerprint scanner and solenoid lock. Designed all software/circuitry and rendered custom enclosure to house electronics in door frame

**Industrial Arduino** *(2017)* – Created a custom PCB shield in Altium Designer for use in a waterproof Arduino Enclosure

**Classmates App** *(2016)* – Designed UI mockup for a mobile app to enhance social and academic experience for students and participated in the Pitt Mobile App Challenge

**Wireless Charging Pack** *(2015)* – Built a portable external battery pack to wirelessly charge mobile devices. Designed and printed custom enclosure to house electronics



**VOLUNTEERING**

**HCEF Instructor** *(2019 - Present)* – Teach fundamentals of computer science to middle school students who have experienced or are currently experiencing homelessness

**YoungLife Music Leader** *(2014 - 2016)* – Played guitar as worship leader for YoungLife high school youth group