# Benjamin Graham

**Carnegie Mellon Electrical and Computer Engineering**
Class of 2022

## Experience

Jan. - present
**Undergraduate Research Assistant**
Cylab Security and Privacy Institute
- Working with Northrup Grumman for the development of visualization tools to detect and monitor the distribution of malicious software.
- Implemented a haptic interface for first responders that interfaces with virtual reality scenarios for the NIST haptic challenge. Currently, the entry has sucessfully completed the first four stages of the competition and is in second place overall.
- Developing a web application to graphically model the behavior of artifical intelligence algorithms.
- Contructed an augmented-reality headset for rescue workers to perform live indoor mapping in scenarios where visibility is compromised.

Summer 2018
**CERT Security Automation Intern**
Software Engineering Institute
- Used Python and Angular for web application development for simplified SiLK internet traffic analysis.

2015 - 2017
**Software Intern**
Carnegie Mellon Robotics Institute
- Wrote software using Swift and Metal for displaying interactive 3D data on mobile devices under the supervision of Professor Simon Lucey.
- Wrote Python and Matlab code for use in a 3D image camera calibration system under the supervision of Professor Fernando De la Torre.
- Designed, 3D printed, and assembled a robot under the supervision of Professor Alonzo Kelly.

## Personal Projects

Jan. - present
**Python Static Analysis Tool**
- Developing a static type-analysis tool for Python to detect type errors and optimize function calls prior to runtime.

Mar. 2019
**Com-Unity Web Application**
- Created a inter-dorm request application for SteelHacks using Node.js.
- Won Snapchat prize for best social media integration.

Nov. 2018
**PyDoom Video Game**
- Developed a 90's style first person video game inspired by the likes of Doom and Quake.
- Used a custom physics and OpenGL graphics engine.
- Won 1st prize overall at the 15-112 Project Showcase.

Oct. 2018
**Blockyslice Video Game**
- Lead programmer for a skill-based video game written for Hack112.
- Won 1st prize overall as well as nomination for "Most Fun".

2017 - 2018
**Voxel-based Render Engine**
- Wrote a voxel-based graphics and physics engine for determining optimal buffer size and geometic meshing method.
- Won 1st place at PJAS, as well as the *Directors award for Computer Science* and the *Duquesne Award for Computer Science*.

2017
**Kathode Android Game**
- Released a rhythm-based video game on the Google Play Store.
- Developed using Java and Android Studio.

## Education

2018 - present
**Carnegie Mellon University**
- Student in Electrical and Computer Engineering.
- Relevant courses include *Introduction to Computer Systems*, *Structure and Design of Digital Systems*, *Functional Programming*, *Principals of Imperative Computation*, *Concepts of Mathematics*, *Fundamentals of Programming*.

## About


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## Skills

**Languages**
- C
- C++
- Python
- Java
- Javascript
- System Verilog
- SML
- x86 Assembly
- Matlab

**Libraries and Frameworks**
- OpenGL
- OpenCV
- Node.js
- d3
- Unreal Engine
- Angular

**Platforms**
- Linux
- Windows
- Android
- HTC Vive
- IOS

**Software**
- git
- Android Studio
- Fusion 360

**Hardware**
- Raspberry Pi
- Arduino
- Altera Cyclone V