

# Jacob Shin

linkedin.com/in/jacob-shin • github.com/jshin313 • jacobshin.com • jacobshin313@gmail.com • 267 393 0368

## Education

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**Temple University**

Philadelphia, PA

Aug 2020 - May 2024

- Bachelor of Science in Computer Science • GPA: 3.93

## Skills

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**Programming Languages/Frameworks:** C, C++, Python, Flask, Javascript, x86 ASM, Java, Selenium

**Markup Languages:**  $\LaTeX$ , Markdown, HTML, CSS

**Other:** Linux, Bash, Git/Github, Tmux, Vim (Neovim), Arduino, REST APIs, GDB (GNU Debugger), Binary Exploitation, Basic Reverse Engineering

## Experience

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**Princeton Plasma Physics Lab Intern**

Princeton, NJ

Oct 2019 - Dec 2019

- Designed circuitry for a Langmuir probe, a device used to measure plasma properties like density and temperature

## Projects

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### Calculator Controlled RC Boat

(C++, TI-BASIC, Arduino)

- Utilized an Arduino and RF wireless modules to create the first ever calculator controlled, remotely controlled boat by interfacing a TI-84+ graphing calculator with a C++ library called ArTICL
- Enabled the library to support the TI-84+ calculator model by tracking down and fixing a bug in the implementation of the TI-Link protocol

### Water Utilization Dashboard

(React, C++, Flask, SQLite, Websockets, Material-UI, ESP8266 WiFi Module)

- Developed a water usage tracking platform using vibration sensors to determine when water was being used and a wifi module to communicate with a Flask backend server via Websockets and a custom built REST API.
- Awarded the best project "using IoT devices and technologies" prize by American Water at the Philly Codefest Hackathon out of 248 participants

### TI-Authenticator: 2-Factor Authentication With a Calculator

(C, HMAC, SHA1, OTP)

- Produced the first calculator app to provide rolling passcodes similar to Google Authenticator and Duo on a TI-84+ CE graphing calculator to enhanced login security via 2-Factor Authentication
- Implemented the two types of One-Time Password (OTP) algorithms from scratch based on the [RFC 4226](#) and [RFC 6238](#) specifications based on a custom implementation of the HMAC algorithm (for learning purposes)

### Web Scraper and Discord Bot

(Python, Flask, SQLite, Postgresql, Rust, Highcharts.js, Heroku)

- Scraped the number of covid cases from the university website and displayed detailed cases vs. time graphs and bar charts with breakdowns of employees and on/off campus students via Flask and Highcharts
- Wrote a bot in Rust to interface to provide close to real time COVID data to various university Discord servers

### College Rejection Simulator

(HTML, CSS, Javascript, Bootstrap, Netlify)

- Helped over 30,000 high schoolers in 25 countries prepare for college rejection letters with an interactive simulation

## Awards/Activities

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### CTF (Capture the Flag Computer Security Competitions):

- 1st at castorsCTF20 (out of 500) • 2nd at OwlHacks RSM CTF • 4th at MetaCTF 2020 (out of 1017) • 4th at RACTF 2020 (out of 1047)
- 25th at PicoCTF 2019 (out of 11722) • 35th at TJCTF 2019 (out of 483) • 13th at MITRECTF 2019 (out of 262)

**Member:** Temple Association for Computing Machinery (ACM)

Aug 2020 - Present

**Member:** Temple Hack-a-Hardware / Computer Security Club

Oct 2020 - Present