# Jacob Shin

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## Education

**Temple University** Expected: May 2024

- BS in Computer Science • Honors Program • President's Scholar: Full-Tuition

## Experience

**Princeton Plasma Physics Laboratory (PPPL) Intern** October 2019 - December 2019

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

## Projects

**TI-Authenticator: 2-Factor Authentication With a Calculator** (C, HMAC, SHA1, OTP)

- Provided rolling passcodes similar to Google Authenticator and Duo except on a TI-84+ CE graphing calculator.
- Implemented One-Time Password (OTP) algorithms based on RFC 4226 (HOTP) and RFC 6238 (TOTP) specifications based on a custom implementation of the HMAC algorithm (for learning purposes).

**Calculator Controlled RC Boat** (C++, TI-BASIC, Arduino)

- Utilized an Arduino and RF wireless modules with a C++ library called ArTICL to interface with a TI-84+ graphing calculator to remotely control a boat.
- Tracked down and fixed a bug in the library that prevented the Arduino from properly interfacing with the specific calculator model.

**Water Utilization Dashboard** (React, Flask, 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.
- Won the best project "using IoT devices and technologies, identify and suggest ways of reducing water waste within a household" prize by American Water at the Philly Codefest Hackathon

**COVID Data Web Scraper and Discord Bot** (Python, Flask, SQLite, 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.

## Skills

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

## Awards/Activities

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