

# Jacob Shin

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## Education

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**Temple University** Philadelphia, PA Aug 2020 - May 2024

- Bachelor of Science in Computer Science • Dean's List • GPA: 3.93

## Skills

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**Programming Languages:** C, C++, Python, Javascript, x86 ASM, Java  
**Other:** Linux, Git/Github, Tmux, (Neo)vim, Ghidra, 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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**MITRE Embedded Security Challenge** (C, AES, AVR)

- Designed a custom bootloader for an Atmega microcontroller with AES-CBC encryption and HMAC verification
- Attacked bootloaders from other teams by dumping flash via JTAG after finding out that fuse bits were incorrectly setup.

**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)

**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

**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:** Pwn Intended CTF Team (Top 100 Globally) May 2019 - Present  
**Member:** Temple Hack-a-Hardware / Computer Security Club Oct 2020 - Present