Jacob Shin

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Education

Temple University **BS in Computer Science (3.97 GPA)** Aug 2020 - May 2024

- President Scholar: Awarded a full tuition scholarship based on academic merit
- Temple Association for Computing Machinery (ACM), Temple Hack-a-Hardware / Computer Security Club

Skills

Programming Languages/Frameworks: C, C++, Python, Javascript, x86 ASM, Java
Markup Languages: LaTeX, Markdown, HTML, CSS
Other: Linux, Bash, Git/Github, Tmux, Vim, Arduino, REST APIs, GDB (GNU Debugger), Binary Exploitation

Experience

Security Engineering Intern **Security Innovation** June 2021 - Aug 2021

- Identified several vulnerabilities in client software by forcing software into states not intended by the developers (e.g. XSS, CSRF, Access Control Bypass, Session Fixation)
- Achieved arbitrary JavaScript execution, escalated privileges from a low privileged user to an administrator user, deleted other users' resources, and accessed data of other clients as a non-privileged user through the above vulnerabilities
- Wrote reports detailing the scope and severity of the vulnerabilities and recommended remediation steps

Undergraduate Research Assistant **Temple University** January 2021 - May 2021

- Implemented a proxy to interface with the IFTTT (If This Then That) platform and IoT (Internet of Things) devices to detect anomalies that could indicate security concerns in a smart home
- Utilized Node.js and the Express Framework to implement a Service API based on the IFTTT specifications

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

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 enhance 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