Garrett Gu

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EDUCATION

08/2018 – 05/2022
Austin, TX

B.S, Computer Science (Honors), B.S. Mathematics, *University of Texas at Austin*
- Member of Turing Scholars Honors Program
- **TA**: Operating Systems, Honors Computer Architecture
- **Graduate coursework**: Automated Logical Reasoning, Systems Verification, Operating Systems, Computer Security
- **Undergraduate coursework**: Ethical Hacking, Virtualization, Honors Artificial Intelligence, Computer Networks, Honors Computer Architecture, Honors Data Structures

PROFESSIONAL EXPERIENCE

05/2020 – 08/2020

Cybersecurity Engineer Intern, *Microsoft*
- Implemented **machine learning** to develop an end-to-end **recommendations system** for M365 Core datacenter **access control** permissions
- Performed feature selection and evaluation on large datasets using **scikit-learn** and **MS SQL**
- Achieved **93% accuracy** benefitting **98%** of >1000 test users, saving an estimated **200 hours** of engineer time per year while improving security

05/2019 – 08/2019

Software Engineer Intern, *The BHW Group*
- Crafted a large-scale school alerts system using **React Native** and **Go** on a team of five, proposing thoughtful API and relational database specifications
- Created a medical information app using **React Native** on the same team, contributing a bespoke, performant JSON-based document storage format
- Provided detailed and helpful **code reviews**, greatly improving codebase quality

PROJECTS

09/2020 – present

ct-Wasmtime, *Constant-Time WebAssembly*
- Generated and verified first end-to-end verified constant-time library using currently unreleased **ARM**v8.4 feature in order to avoid timing side-channel attacks
- Modified existing **WebAssembly JIT** compiler and runtime to accept code in ct-wasm, a constant-time superset of WebAssembly
- Implemented static dataflow analysis to verify constant-timeness of ARM machine code in **Ghidra**, an open-source reverse-engineering framework released by the NSA

04/2019 – 06/2019

OOPBoy, *Game Boy Emulator*
- Built a state-of-the-art Nintendo Game Boy™ emulator on a team of two using **Java**
- Achieved full-system emulation of **dozens of games**, including Zelda, Mario, Tetris, Pokemon, Pac-Man and Kirby at full speed with full support for sound, color, save states, and rewind
- Emulator surpasses official Nintendo emulator in several CPU accuracy benchmarks

ORGANIZATIONS

12/2018 – present

UT Information and Systems Security Society, *Engineering Officer*
- Created Capture-the-Flag **cybersecurity** challenges using C, C++, JavaScript, and assembly for biweekly competitions with **>100** contestants on average
- Prepared and presented writeups and talks over security techniques and best practices, including **web exploitation**, **code injection**, **buffer overflows**, and **reverse engineering**
- Authored several innovative challenges for an international CTF, attracting **>5,000** unique competitors from **>60** countries

SKILLS

Languages
JavaScript, TypeScript, C, SQL, C#, Java, bash, Python, Rust

Tools
React, React Native, Express, gdb, git, docker, Ghidra

Competitive Programming
USA Computing Olympiad (USACO) Platinum Qualifier

Tetris
Top 0.1% player on Tetris Effect Zone Battle