Allen Chang

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Education

GEORGIA INSTITUTE OF TECHNOLOGY, ATLANTA, GEORGIA • GPA: 3.97/4.00   **~ EXPECTED DEC '25**

- **B.S.**, Double Major: **Computer Science (Info. Internetworks/SysArch); Mathematics (Discrete)**
- **Relevant Coursework:** Binary Exploitation, Operating Systems, Information Security, Processor Design, Networking, Computer Systems & Networks, Algorithm Design, Artificial Intelligence, Graph Theory, Complex Analysis, Compilers, Databases

PRINCETON UNIVERSITY, NEW JERSEY • DUAL ENROLLMENT WITH HIGH SCHOOL   **SEP '21 – JUN '22**

- **Relevant Coursework:** Real Analysis, Analytic Combinatorics, Algorithms and Data Structures

Research/Work Experience

RESEARCH AND ENGINEERING, CRYPTOGRAPHY INTERN • TRAIL OF BITS   **JUN '25 – PRESENT**

- Contributed to pwndbg, a GDB plugin for reverse engineering and exploit writing, on enhancements in Linux kernel debugging
- Developed a pwndbg MCP server capable of debugging crashes, identifying vulnerabilities, aiding debugging, and more
- Researched and developed agentic auditing tools to automate vulnerability discovery and support security audits

RESEARCH ASSISTANT • ASTROLAVOS LAB AT GEORGIA TECH • DR. FABIAN MONROSE   **MAY '23 – MAY '25**

Actively Understanding the Dynamics and Risks of the Threat Intelligence Ecosystem

- Analyzed malware data to study the propagation of information between antivirus vendors using graph theoretic techniques
- Authored self-modifying malware in Go to exfiltrate environment info from sandboxes and trigger sample sharing with vendors
- Paper (in progress): "Sharing is Caring: Understanding Real-Time Dynamics of Threat Intelligence Sharing"

Integrating LLM-based Teaching Assistant with Gamified Cybersecurity Teaching Platform

- Developed in a team of five private cybersecurity teaching platform and website, based in Node.js, for use in undergraduate course
- Created and integrated virtual teaching assistant for use in platform to provide feedback to students in programming assignments

MEMBER • SECURE HARDWARE PROJECT TEAM • DR. VINCENT MOONEY   **AUG '23 – MAY '25**

- Developed novel lightweight cryptographic primitive for nonlinear sequence generation based on chained product registers, competitive with NIST lightweight cryptography finalists in cost and performance metrics (i.e. chip area, energy consumption)
- Cryptanalyzed primitive by developing theory and implementing a variety of novel algebraic-based attacks and NIST statistical tests in SageMath, such as extensions of cube attack variants and group theoretic algorithms for linear complexity estimation

Publications

Gordon, D., … **Chang, A.** et al., Scalable Nonlinear Sequence Generation using Composite Mersenne Product Registers. *IACR Communications in Cryptology,* vol. 1, no. 4, Jan 13, 2025

Experience

CAPTURE THE FLAG (CTF) TEAM MEMBER • SQUID PROXY LOVERS CTF TEAM   **'25 – PRESENT**

- Member of private team ranked #3 in US (CTFTime, 2025), specializing in cryptography challenges

CTF TEAM, EXECUTIVE BOARD MEMBER • GREYHAT CYBERSECURITY CLUB   **'22 – '25**

- Represented Georgia Tech in a 4-person team at CSAW CTF Finals at NYU (2024: 4th/1181; 2023: 2nd/1098; 2022: 7th/884)
- Lectured on variety of cryptography topics, such as RSA and elliptic curves, for twice-weekly club meetings
- Authored cryptography challenges for GreyHat's CTF competition (WRECKCTF) and internal CTF practice platform

TEACHING ASSISTANT • HONORS DESIGN AND ANALYSIS OF ALGORITHMS   **AUG '23 – DEC '24**

- Developed study resources, such as live-TeXed lecture transcriptions & practice exams, hosted weekly office hours, graded papers

SIMULATIONS SUBTEAM MEMBER • GEORGIA TECH EXPERIMENTAL ROCKETRY   **AUG '22 – JAN '23**

- Implemented Monte Carlo-based simulation for rocket and parachute dispersion analysis in Python
- Developed in collaboration multistage rocket simulator using rocketpy for neural network-based rocket optimizer

Skills

PROGRAMMING: (Advanced) Python, Java • (Intermediate) C, R, x86 assembly, VHDL, Verilog, Golang, Bash
TOOLING: SageMath, WSL, Ghidra, gdb, Wireshark, pwntools, Z3, matplotlib

Leadership

SCIENCE OLYMPIAD   **'19 – PRESENT**

- Performed penetration testing and bug hunting on **Scilympiad testing software**, used by 75,000 students in 1,000 tournaments
- **President** ('23 – '24) of **Science Olympiad at GT** and **Tournament Director** of **GA High School State Tournament**