Tony Cao

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EDUCATION

Swarthmore College Sep 2021 - May 2025

BA in Computer Science and Mathematics (GPA: 3.8 / 4.0) *Swarthmore, PA*

Relevant Courses: Operating Systems, Data structures, Algorithms, Databases, Distributed Systems, Machine Learning

EXPERIENCE

Solutions Engineer Sep 2024 – Present

Flint AI, tryflint.com *San Francisco, CA*

- Delivered 50+ production marketing sites for enterprise clients (Cognition, Pylon, Graphite) using React/TypeScript and Tailwind; owned CI/CD, deployments, and client requests end-to-end
- Built internal CLI tool to export HTML canvas elements as videos with TypeScript and Python, using perceptual hashing and autocorrelation for loop detection and accelerating site replication workflow
- Implemented company marketing site from Figma designs; instrumented PostHog analytics and HubSpot automation, handling 500+ daily form submissions at public launch
- Ran SEO ops with Google Search Console, sitemaps, and OpenGraph for accurate search indexing and branding

Research Assistant Jun 2024 – Aug 2024

Swarthmore College, CS department ([eBook](#)) *Swarthmore, PA*

- Developed interactive frontend components with jQuery and D3.js, enhancing assembly and CPU architecture chapters of open-source CS textbook adopted at 60+ institutions
- Automated problem generation using JavaScript, creating C interpreter, fork simulator, and distractor generator for assembly, eliminating manual problem construction and validation

Software Engineer Intern Jun 2023 – Aug 2023

GMD Protocol (Crypto Startup) *Ho Chi Minh City, Vietnam*

- Built backend service with Python and Google Cloud Platform to simplify order management for cryptocurrencies derivatives by removing webapp dependency, enabling automated trade scheduling and more accurate metrics
- Spearheaded productization of backend into a one-click trading interface on Telegram via Python, building the MVP solo in 8 weeks and securing $500K in dedicated product funding
- Designed a secure key vault to store private keys with MongoDB, used bcrypt and ChaCha20-Poly1305 to enable password protection with salt/pepper and envelope encryption scheme

PROJECTS

Hypercubic Peer-to-Peer Network | *C, Python, R* [GitHub]

- Implemented a TCP chat network with hypercube topology in C, achieving $O(\log N)$ hops for highly scalable messaging
- Designed neighbor assignment logic to handle dynamic joins/leaves, ensuring consistent routing and fault tolerance

SIMD Game of Life Engine | *C* [GitHub]

- Optimized GOL engine in C using pthreads and cache optimizations, achieving 120x speed up and linear scaling
- Applied SSE/AVX instructions with bitmasks and bitpacked data structure to accelerate parallel computing

Analysis of Mersenne Twister (mt19937) PRNG | *C++, Python, R* [Report]

- Processed 9TB of mt19937 output with C++ and NIST test suite to examine long-term statistical properties
- Analyzed 360,000 data blocks using Python and R, compared observed p-values against theoretical distributions

Anti-Recommendation Music Platform | *React, Python* [GitHub]

- Developed an open-source React/Flask webapp with custom recommender system to deliver anti-recommendations
- Built a parallel ETL pipeline using Python futures and pandas to mine, clean, and validate a 10,000-track dataset

SKILLS

Languages: C, C++, Python, JavaScript/TypeScript, SQL, Shell Scripts
Frameworks & Libraries: React, Tailwind CSS, Flask, D3.js, pandas, Spotipy, pthreads, MPI, CUDA
Tools: Git, MongoDB, GCP Compute Engine, Linux, GCC, GDB, gprof, Valgrind, Cachegrind, Vite