

Garrett G. Fincke

Full-stack developer specializing in clean code, scalable systems, and modern web/mobile architecture
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Education

The Pennsylvania State University, University Park, PA
Bachelor of Science in Computer Science

Aug 2021 – Dec 2024

Experience

Scale AI — Remote

May 2024 – Jul 2025

Software Engineering Contractor

Python, TypeScript, JavaScript, Java, Swift, PostgreSQL

- Built internal tooling to evaluate LLM-generated code for clients including Google, Meta, and OpenAI
- Automated compilation, execution, linting, and test orchestration to measure pass@k and correctness
- Contributed to Google's Stitch UI code-generation workflow by building prompt templates and evaluation harnesses that improved component fidelity and layout accuracy
- Designed data pipelines for training/eval (schema/versioning, validation, deterministic sampling) that replaced manual review with scripted checks and reduced turnaround time
- Instrumented metrics and built dashboards (syntax/style error rates, test failure modes); triaged failures with research/eng partners to accelerate model iteration cycles
- Authored seed datasets and context frameworks emphasizing clean, idiomatic solutions and explicit performance trade-offs
- Enforced schema normalization and deduplication at ingest via scripted checks for data quality assurance

Pink Ocean Collectibles — Online Ecommerce

Apr 2020 – Present

Owner / Operator

Python, eBay APIs, TCGPlayer APIs

- Build and operate multi-channel storefront for collectibles and refurbished electronics (eBay, TCGPlayer, Facebook Marketplace, StockX) with 2000+ sales since launch
- Generate over \$60k in lifetime profit through data-driven sourcing and dynamic pricing strategies across trading cards, comics, video games, retro consoles, and consumer electronics
- Maintain exceptional customer relationships with 100% positive rating across all platforms through accurate listings, timely fulfillment, and excellent customer service across online and in-person transactions
- Develop comprehensive automation suite including listing pipelines (Python + marketplace APIs for eBay, TCGPlayer, Facebook Marketplace, StockX), dynamic pricing tools based on market trends, and analytics dashboard for performance tracking
- Repair and mod consumer electronics (e.g., iPhones, Game Boys/GameCubes, vintage PCs) and sell restored units through storefront

Pennsylvania State University — University Park, PA

Aug 2024 – Dec 2024

CMPSC 475 Learning Assistant (iOS / Applications Programming)

Swift, SwiftUI, UIKit, React

- Mentored students in iOS/mobile application development using Swift and SwiftUI, emphasizing clean code practices and sound design patterns
- Reviewed and debugged student code, enhancing their understanding of application programming concepts and code quality standards
- Collaborated with faculty to tailor instruction based on student progress and technical challenges with focus on strong coding fundamentals

Chipotle Mexican Grill — Bridgeville, PA and State College, PA

Oct 2022 – May 2024

Crew Member

- Prepared and cooked food while maintaining strict adherence to food safety standards and quality control protocols

- Washed dishes, cleaned prep stations, and ensured overall cleanliness of store with attention to operational efficiency
- Served customers on the line with focus on speed, accuracy, and hospitality during high-volume periods
- Worked collaboratively with coworkers and managers to maintain smooth operations during peak hours and busy periods

Scott Township — Carnegie, PA

May 2022 – Aug 2022

Pool Manager

- Oversaw daily pool operations to ensure safe, fun, and welcoming environment for all patrons with focus on safety protocol compliance
- Trained and mentored junior lifeguards on Red Cross and Scott Pool safety protocols, developing leadership and training skills
- Coordinated and executed community events and holiday celebrations at the pool, demonstrating project management abilities
- Enforced safety regulations and responded to incidents with professionalism, composure, and adherence to emergency procedures

Scott Township — Carnegie, PA

Jun 2019 – Aug 2021

Lifeguard

- Monitored pool activity and enforced safety rules in alignment with Red Cross and Scott Pool protocols for patron safety
- Maintained cleanliness and presentation of pool area and surrounding park grounds with attention to detail and public service
- Taught group and private swim lessons to individuals of varying ages and skill levels, developing instructional and communication skills
- Collaborated with fellow lifeguards to ensure safe and enjoyable environment for all patrons during busy summer seasons

Projects

Hopper

Sep 2025 – Present

Java, Spring Boot, Spring Data JPA, PostgreSQL, Flyway, H2, Spring Security, Spring Batch, Actuator, Gradle
Cross-platform inventory management for ecommerce sellers; centralizes products, listings, orders, and fees across marketplaces.

- Design normalized relational schema with Flyway migrations for core entities: products, listings, orders, order items, buyers, order addresses, and platform fees with indexes and constraints
- Implement REST endpoints for platform management and health/version reporting (e.g., ‘/api/platforms’, ‘/healthz’) using JPA repositories and DTOs
- Configure multi-environment database setup: PostgreSQL for production and H2 for testing with reproducible migrations and seed scaffolding
- Build JPA entities with unique constraints and repository query methods; add repository tests validating uniqueness and query behavior
- Establish foundations for secure credential storage and future sync jobs via Spring Security and Spring Batch

Loom

Aug 2025 – Present

Python, Typer, OpenAI, Anthropic Claude, Ollama, DOCX, LaTeX, JSON, CLI

CLI for AI-powered resume tailoring with multi-provider AI integration and structured document editing.

- Build comprehensive CLI architecture with clean architecture and modular design using Typer-based command suite (sectionize, generate, apply, tailor), configurable defaults system, and enhanced help/theme tooling
- Provide complete workflow automation for resume tailoring and document processing
- Engineer multi-provider AI architecture supporting OpenAI, Anthropic (Claude), and local Ollama models for

flexible deployment

- Implement structured JSON edit operations (replace line, replace range, insert after, delete range) on line-numbered text
- Design format-preserving document processing pipeline supporting both DOCX and LaTeX with formatting retention and robust error handling

TrackBasket

May 2025 – Present

TypeScript, Python, Supabase, Next.js, React, OpenAI, PostgreSQL, Docker, Swift

Deployed price tracking platform monitoring 30k+ products across 4 major retailers (Amazon, Target, Walmart, and more) with AI-powered features.

- Develop chat-to-basket feature using OpenAI API that converts natural language into structured baskets using Supabase data integration
- Implement advanced web crawling system with CAPTCHA solving, anti-bot countermeasures, intelligent rate limiting, and data normalization pipeline
- Create comprehensive backend infrastructure with Edge Functions, PostgreSQL fuzzy search, UPC matching, and real-time notifications
- Build AI-powered product matching with intelligent alternatives and cross-retailer price correlation for comprehensive UPC lookup
- Engineer sophisticated notification system with granular user preferences for price drops, availability changes, and product updates
- Develop responsive basket management with collaborative sharing, real-time price history charts, and smart product recommendations
- Build for Bolt Hackathon with live deployment showcasing full-stack development and AI integration capabilities

SwimMate

Feb 2024 – Jun 2024, May 2025 – Present

Swift, SwiftUI, HealthKit, WatchKit, Swift Charts, WatchConnectivity

Final Project for CMPSC 475: Applications Programming; native iOS/watchOS app for swimmers.

- Develop comprehensive swimming app for tracking, finding, and saving workouts with progress visualization over time
- Build custom components using HealthKit and SwiftUI for workout entry, lap timing, and charting performance trends with Swift Charts
- Connect iOS app to Apple Watch for real-time workout data tracking, sending premade workouts, and displaying rich metrics
- Implement goal-based workouts for distance, time, or calories with real-time progress tracking and pace monitoring
- Create full-featured app supporting offline workout tracking, cross-device sync via WatchConnectivity, custom workout builder, workout history with detailed analytics, and data export/sharing capabilities
- Design Apple Watch interface displaying real-time metrics including pace, heart rate, laps, SWOLF, and calories burned
- Support both pool and open-water swims with GPS distance tracking and comprehensive HealthKit integration
- Achieved grade of 100% on original submission, demonstrating excellence in iOS/watchOS development and app architecture

Portfolio Website

Mar 2025 – Present

Next.js, TypeScript, Tailwind CSS, React, Node.js, Git, GitHub Actions, CI/CD, Lighthouse CI, ESLint, Figma

Personal portfolio website showcasing modern web development and design skills.

- Build responsive portfolio website with Next.js, React, and TypeScript using modern development practices
- Implement modern, responsive design with animations and transitions using Tailwind CSS for optimal user experience
- Create custom component system for UI consistency and maintainable codebase architecture

- Design with accessibility and performance optimization in mind, following web standards and best practices
- Configure continuous deployment with Vercel for automated builds and seamless updates
- Use Figma to design, prototype, and iterate on website layout and custom logo design
- Automated CI/CD and release workflow with automated prereleases/tags, Lighthouse CI checks, and consistent tooling

InStock

Dec 2024 – Mar 2025

Python, Django, PostgreSQL, Selenium, Redis, Celery, React, Swift, Discord.py

High-performance price & stock tracking system; foundation project that evolved into TrackBasket.

- Designed optimized tracking system for speed, frequency, and accuracy in detecting restocks and price changes on high-velocity products
- Created custom database schema using Django's ORM & PostgreSQL for efficient data storage, retrieval, and scalable performance
- Engineered microservices architecture in Django with Redis and Celery for predictable, scalable, and reliable performance
- Built comprehensive RESTful API endpoints for data retrieval & user management serving React frontend & Swift mobile app
- Integrated Discord bot functionality via Discord.py for real-time notifications and user interaction
- Project laid groundwork for evolution into TrackBasket, expanding into full-featured price-tracking platform with enhanced capabilities

Deep Learning Architecture Comparison & Analysis for CIFAR-10 (with Jacob Goulet, Tyler Rossi, Diego Bueno, Javier Pozo Miranda, Duong Bao)

Nov 2024 – Dec 2024

Python, TensorFlow, Keras, NumPy, pandas, matplotlib, seaborn, scikit-learn, Deep Learning, CNN, ResNet, DenseNet, LaTeX, Random Fourier Features

Final report for MATH 452: Mathematical Foundations of Machine Learning; comprehensive deep learning study.

- Benchmarked four approaches on CIFAR-10 dataset (60k images): baseline CNN, ResNet50, DenseNet121, and Random Feature Model (RFM) with 5,000 Random Fourier Features
- DenseNet121 achieved top test accuracy at 74%, outperforming baseline CNN (69%), RFM (51.6%), and ResNet50 (47%)
- Engineered ResNet-inspired CNN with residual blocks, data augmentation, dropout, and L2 regularization
- Documented optimization challenges and remedies throughout model development process
- Built lightweight RFM pipeline (StandardScaler \rightarrow RBFSampler \rightarrow LogisticRegression) with performance logging at 10 checkpoints
- Generated confusion matrices, full metric suite (accuracy, precision, recall, F1, log-loss), and detailed loss/accuracy curves; proposed future work including hybrid CNN-RFM ensemble, advanced ResNet scheduling, and larger datasets
- Achieved grade of 100% on this comprehensive report and implementation, demonstrating mastery of deep learning architectures and analysis

TCGhub (with Yash Tumuluri)

Sep 2024 – Dec 2024

React, SQL, Python, SQLite, Node.js

Final Project for CMPSC 431W: Database Management Systems; trading card marketplace platform.

- Developed React-based trading card marketplace with live data integration, essentially replicating tcgplayer.com functionality
- Customized complex database schema in BCNF (Boyce-Codd Normal Form) and hand-wrote all SQL queries to local SQLite database
- Implemented comprehensive filtering and search functionality for card sets, rarities, and marketplace features
- Styled with modern CSS to create clean, responsive UI with intuitive user experience and professional appearance
- Achieved grade of over 100% on this project, demonstrating mastery of database design and full-stack develop-

ment

Computer Architecture Projects

Sep 2024 – Dec 2024

C/C++, SimpleScalar, Python, Cache Hierarchies, Branch Prediction, Performance Analysis

Two comprehensive projects for CMPEN 431: Computer Architecture; architecture design exploration and branch prediction analysis.

- Built heuristic-driven framework on SimpleScalar to explore multi-dimensional cache/memory configurations across benchmarks; automated validation, configuration generation, and evaluation to identify high-performance and energy-efficient designs
- Implemented and compared branch predictors — static, one-bit, two-bit saturating, bimodal, gshare, and hybrid with chooser — including update logic and measurement of prediction accuracy/misprediction rates on traces
- Produced detailed reports outlining configuration trade-offs, predictor performance, and recommendations grounded in quantitative analysis

Traditional Machine Learning Methods Exploration for MNIST

Sep 2024 – Oct 2024

Python, scikit-learn, NumPy, pandas, matplotlib, seaborn, Machine Learning, LaTeX

Midterm report for MATH 452: Mathematical Foundations of Machine Learning; comprehensive ML analysis.

- Implemented and compared KNN (94.4% accuracy), Logistic Regression (91.1%), and SVM with RBF kernel (95.3%) on 10k-image MNIST subset
- Applied rigorous preprocessing pipeline: random sampling, normalization to [0,1], flattening to 784-D vectors, stratified 80/20 train-test split
- Performed hyperparameter tuning (k=3 for KNN, C=1 and RBF kernel for SVM) using grid search cross-validation with comprehensive evaluation
- Executed unsupervised learning using K-Means (k=10) with PCA dimensionality reduction and examined elbow method and silhouette scores
- Discussed computational constraints (high-dimensional SVM training) and proposed CNNs as future work to approach state-of-the-art accuracy
- Achieved grade of 100% on report and implementation, showcasing excellence in traditional machine learning methods and statistical analysis

COVID-19 Case Surveillance Analysis (with Edwin Clatus, Sahit Botta)

May 2024 – Aug 2024

Python, Machine Learning, pandas, NumPy, scikit-learn, matplotlib, seaborn, Jupyter

Comprehensive coursework for STAT 319: Applied Statistics; data science project.

- Completed end-to-end data science projects using Python ecosystem including pandas, NumPy, matplotlib, seaborn, and scikit-learn
- Implemented machine learning models including linear regression, logistic regression, SVM, KNN, and decision trees with comprehensive evaluation
- Collaborated on COVID-19 case surveillance analysis for final project using large-scale public health data with preprocessing and visualization
- Mastered statistical analysis, model validation, hyperparameter tuning, and cross-validation techniques for robust model development
- Achieved grade of 100% on final project, demonstrating excellence in collaborative data science and statistical modeling

BetterBettor

Mar 2024 – May 2024

Solidity, Next.js, Ethereum, Web3.js, MetaMask, React

Final Project for CMPSC 263: Blockchain and Modern Web Development; decentralized sports betting platform.

- Built decentralized sports betting platform using Ethereum smart contracts for transparent, trustless wagering system
- Developed modern React/Next.js frontend with Web3 integration for seamless blockchain interaction and user experience

- Implemented comprehensive betting system with customizable odds, automated payouts, and user wallet integration via MetaMask
- Created responsive design supporting multiple sports categories with real-time betting interface and intuitive user navigation

OPTIMUS

Feb 2024 – Apr 2024

Python, Transformers, Discord.py, HuggingFace, APScheduler

Fine-tuned Discord chatbot using Microsoft's GODEL-v1.1 model for contextual conversation generation.

- Built fine-tuned Discord chatbot using Microsoft's GODEL-v1.1 model for advanced contextual conversation generation
- Integrated HuggingFace Transformers to run local inference with custom-trained seq2seq model for personalized responses
- Created rich Discord interactions including emote reactions, user-specific triggers, and dynamic status updates for enhanced user engagement
- Designed 'Free Rein' and 'Puppeteer Mode' features to control bot behavior based on real-time message context and user preferences

iOS Application Development Projects (with Ashley Amendola)

Jan 2024 – Mar 2024

Swift, SwiftUI, UIKit, MapKit, Core Data, JSON, Custom Shapes, Gesture Handling, MVC/MVVM, Xcode

Five comprehensive projects for CMPSC 475: Applications Programming; advanced iOS development.

- Built LionSpell word puzzle game with custom polygon shapes, multi-language preferences, hints system, and New York Times-style UI design
- Developed Pentominoes puzzle game implementing drag gestures, 3D rotation animations, JSON data parsing, and automated solve/reset functionality
- Created Campus mapping applications using both SwiftUI Map and UIKit MKMapView with user location tracking, route planning, turn-by-turn directions, and annotation clustering
- Designed Pok'edex catalog app featuring card-based UI, type filtering, capture/release persistence, evolutionary chains, and comprehensive data management
- Achieved grade of 98% average across all projects, demonstrating mastery of iOS development patterns, gesture handling, and advanced SwiftUI/UIKit integration

Memory Management & Threading in C (with Avanish Grampurohit)

Sep 2023 – Dec 2023

C, Systems Programming, Operating Systems, Memory Management, Threading

Three comprehensive projects for CMPSC 473: Operating Systems; advanced systems programming.

- Developed memory management simulator implementing FIFO, LRU, and optimal page replacement algorithms with demand paging system
- Built custom thread scheduler with cooperative and preemptive scheduling, round-robin and priority-based algorithms, and mutex synchronization
- Extended minimalist OS kernel with new system calls, process management features, and kernel-level debugging tools for enhanced functionality
- Achieved grade of 100% average on all assignments with comprehensive testing, validation, and thorough documentation

MIPS Processor (with Avanish Grampurohit)

Mar 2023 – May 2023

Verilog, FPGA, Digital Design, Xilinx Vivado

Final Project for CMPEN 331: Computer Organization and Design; complete processor implementation.

- Implemented complete single-cycle MIPS processor in Verilog HDL with 32-bit architecture and Harvard memory organization
- Built comprehensive instruction set support including arithmetic, logical, memory, branch, and jump instructions with full functionality
- Designed modular architecture with separate components for ALU, control unit, register file, and memory

systems for optimal performance

- Achieved grade of 100% with thorough testing and validation of all processor components and comprehensive instruction type coverage

JBOD Storage System with Caching & Network Communication

Sep 2022 – Dec 2022

C, Systems Programming, Storage Systems, Networking, Caching

Five comprehensive labs for CMPSC 311: Introduction to Systems Programming; advanced storage system.

- Implemented complete JBOD (Just a Bunch of Disks) storage system with block-level operations across multiple disks for scalable storage
- Built high-performance caching layer using LFU (Least Frequently Used) replacement policy with dynamic cache management for optimal performance
- Developed distributed storage system with TCP/IP client-server architecture and robust network communication protocols
- Achieved grade of 100% on all assignments with comprehensive testing, validation, and thorough system integration verification

USBAP (with Yugal Kithany, Kyle Lynch)

May 2023 – Jun 2023

Python, Web Scraping, Data Analysis, BeautifulSoup

Experimental web scraping project for sports betting data extraction and analysis.

- Developed comprehensive web scraping tools for extracting sports betting data from major platforms including DraftKings and FanDuel
- Built automated data collection system using Python with BeautifulSoup for parsing complex HTML structures and dynamic content
- Implemented data extraction for multiple betting markets including moneylines, spreads, and totals across various sports categories
- Created foundation for sports betting analytics and arbitrage opportunity detection with automated data processing pipeline

Technical Skills

Languages: Python, Swift, C, JavaScript (ES6+), TypeScript, Java, SQL, Solidity, Verilog

Frontend: React, Next.js, Tailwind CSS, HTML5, CSS3

Backend & APIs: Node.js, Django, FastAPI, Celery, REST APIs, Spring Boot

Databases & Caches: PostgreSQL, SQLite, Supabase, Firebase, Redis

Mobile (iOS & watchOS): SwiftUI, UIKit, iOS, watchOS, HealthKit, WatchKit, WatchConnectivity, MapKit, Core Data, Swift Charts

AI/ML & Data: PyTorch, TensorFlow, Keras, scikit-learn, Hugging Face Transformers, OpenAI API, Anthropic Claude API, Ollama, pandas, NumPy, matplotlib, seaborn, Jupyter; Deep Learning (CNNs, ResNet, DenseNet), Random Fourier Features

DevOps & CI/CD: CI/CD (GitHub Actions), Docker, Microservices

Web3 & Blockchain: Web3.js, MetaMask, blockchain development

Systems & Architecture: Operating systems, computer architecture, storage systems

Hardware & EDA: FPGA, Xilinx Vivado, digital design

Tools & Design: VS Code, Xcode, Figma, L^AT_EX

Specialized: Web scraping (Selenium, BeautifulSoup), CLI development (Typer), bots (Discord.py), CAPTCHA solving, data analysis

Activities & Interests

- Endurance sports — Ironman 70.3 finisher (Summer 2024); ongoing swim/run training and structured race prep
- Cycling — training component for triathlon; enjoys exploring local bike trails and endurance rides
- Swimming — pool & open water; technique/metrics nerd; dogfooding SwimMate features on real workouts

- Running — local 5K/10K/HM races; enjoys tempo/interval work and course planning
- Strength training & mobility work — complements endurance training; focus on injury prevention and performance enhancement
- Open-source contributions & hackathons — active in developer community; enjoys collaborative coding and rapid prototyping
- Photography — captures travel moments and outdoor adventures; pairs well with exploration and design sensibility
- Journaling — weekly reflection and goal tracking; personal knowledge base for ideas & projects
- Music production — compose & mix instrumentals; experiment with sound design and arranging
- Video games — systems/strategy and indie titles; interest in game design and UX
- Travel — hike-friendly, budget-conscious trips; itinerary building and exploring local food/culture

Courses

ANTH 140 – Anth of Alcohol	EGEE 101 – Energy and Envrnmnt
CAS 100B – Effective Speech	ENGL 15 – Rhetoric and Comp
CMPEN 270 – Digital Design	ENGL 202C – Technical Writing
CMPEN 331 – Comp Org and Design	ENGL 229 – Digital Studies
CMPEN 431 – Intro Comput Arch	GAME 160N – Video Game Culture
CMPSC 111 – Logic Comp Sci	GER 2 – Elem German II
CMPSC 131 – PROG & COMP I	KINES 61 – Fit Thry&Practice
CMPSC 132 – PROG & COMP II	MATH 140 – CALC ONLY GEOM I
CMPSC 221 – Oop With Web	MATH 141 – CALC ONLY GEOM II
CMPSC 263 – Blockchain and Modern Web Dev	MATH 220 – Matrices
CMPSC 311 – Intro Sys Progmng	MATH 230 – Calc/Vector Anly
CMPSC 360 – Discrete Math/Cs	MATH 319 – Elem. Mathematical Statistics
CMPSC 431W – Database Mgmt Syst	MATH 441 – Matrix Algebra
CMPSC 461 – Prog Lang Concepts	MATH 451 – Numer Computations
CMPSC 464 – Intro Theory Comp	MATH 452 – Deep Learning Algorithms
CMPSC 465 – Data Struc and Algor	MATH 486 – Math Thy of Games
CMPSC 466 – Intro to Quantum Computation	MUSIC 8 – Rud of Mus
CMPSC 473 – Operating Sys	PHYS 211 – Mechanics
CMPSC 475 – App Programming	PHYS 212 – Elect. and Mag.
COMM 150N – Cinema Art	PSYCH 100 – Intro Psychology
CYBER 100S – COMPSYS LIT	STAT 318 – Elem Probability
ECON 102 – Microeconomic Analysis	STAT 319 – Elem. Mathematical Statistics