

# 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 and harnesses 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

April 2020 – Present

*Owner / Operator*

*Python, eBay APIs, TCGPlayer APIs*

- Build and operate multi-channel storefront for collectibles and refurbished electronics (eBay, TCGPlayer, Facebook Marketplace) 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 on eBay, TCGPlayer, and 5-star rating on Facebook Marketplace 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), 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

**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 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

**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) 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, 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

### **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 → RBFSampler → LogisticRegression) with performance logging at 10 checkpoints
- Generated confusion matrices, full metric suite (accuracy, precision, recall, F1, log-loss), and detailed loss/accuracy curves
- 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 development

**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
- 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 Pokédex 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

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**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<sup>A</sup>T<sub>E</sub>X

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

## Activities & Interests

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- 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