Tailai Ying

385-256-3856 | tty6@cornell.edu | Portfolio | LinkedIn | GitHub

Education

College of Engineering, Cornell University — Ithaca, NY
B.S. in Computer Science, Minor in Business, GPA: 3.54 — *Expected May 2027*

Coursework

Object-Oriented Programming and Data Structures, Discrete Structures, Probability Models and Inference, Linear Algebra, Analysis of Algorithms, Data Structures and Functional Programming, Digital Logic and Computer Organization

Technical Skills

Languages: Java, C++, Python, SQL, JavaScript, TypeScript, HTML, CSS, Sass, OCaml, Verilog
Web and App Development: Next.js, React, Express, Flask, Node.js, TailwindCSS, Spring Boot, Angular
Tools and Technologies: Git, GitHub Actions, Figma, Postman, Prisma, PostgreSQL
Machine Learning and Artificial Intelligence: PyTorch, OpenCV, NumPy, PyBullet, MyoSuite

Experience

Tutor — May 2025 – Present
Freelance — *Remote*
- Providing personalized one-on-one tutoring to help 2 student master CS fundamentals such as data structures, algorithms, and programming through customized study materials and practice exercises, while providing support and guidance for self-directed projects

Research Assistant — May 2025 – Present
EmPRISE Lab, Cornell University — *Ithaca, NY*
- Developing an LLM-based machine learning model to initiate a high-level patient controller in caregiving robots for individuals with mobility limitations
- Creating a novel ML algorithm based on the musculoskeletal system to dynamically adapt controllers to fit unique individual needs

Research Intern — May 2025 – Present
Aria Lab, University of Utah — *Salt Lake City, UT*
- Extending two-dimensional swarm behavior to three-dimensional swarm behavior for deployment in drone swarms
- Developing swarm controller models using evolutionary novelty search algorithms to discover novel emergent collective behaviors

Technical Lead — Jan. 2025 – Present
CommuniCare — *Ithaca, NY*
- Developed full-stack web application with React and Express as technical lead of healthtech startup with 20+ members to connect underserved communities to healthcare resources
- Spearheaded the software development life cycle, including system design, implementation, testing, and deployment
- Implemented Agile methods with weekly sprints and meetings, greatly enhancing collaboration and team productivity
- Configured GitHub Actions CI/CD pipeline, automating deployment processes and streamlining team workflow
- Raised $32,000 in initial seeding round and partnered with over 5 community and hospital systems across the greater NY area

CS Subteam Member — Feb. 2024 – Present
Cornell Autonomous Drone — *Ithaca, NY*
- Implemented mono and stereo camera based visual odometry algorithms including dynamic distance and angle calculation in conjunction with the YOLOv10 object detection model to enhance localization precision for autonomous drone navigation
- Automated data preparation and training with custom Python script, reducing manual processing time by more than 50%

Projects

Ear Trainer v2 | *Spring Boot, Angular, PostgreSQL, Java, TypScript, Sass* — Jun. 2025 - Jul. 2025
- Revamped original ear training app with a new tech stack and cleaner, more efficient code structure and system architecture
- Utilized VexTab and Tone.js to generate interactive intervals, chords, and chord progression exercises with 10 grade levels based on the 2022 RCM Piano Syllabus
- Implemented user authorization and authentication via bCrypt password hashing with PostgreSQL integration for progress tracking

OCaml Web Server | *OCaml, Lwt* — Mar. 2025 - May 2025
- Designed and implemented a thread-safe HTTP server with RESTful API in OCaml, featuring a modular architecture with routing, request/response handling, and JSON parsing
- Engineered a persistent CSV-based database system with CRUD operations and comprehensive query functionality
- Developed extensive test suite with OUnit2, achieving over 95% line coverage to ensure reliability across all server components including TCP connections, request parsing, and error handling

CritterEvo | *Java* — Dec. 2024 – Feb. 2025
- Built an procedurally generated artificial life simulator with genetic inheritance and mutation to simulate natural selection and evolution
- Improved pathfinding with the A* search algorithm, enabling critters to navigate obstacles and locate resources efficiently
- Implemented a neural network from scratch for high level decision-making, integrating the NEAT genetic algorithm to dynamically evolve critter intelligence for emergent behavior
- Designed robust JUnit black and glass-box test suites to validate functionality and maintain consistency across edge cases
- Optimized application performance with multithreading, achieving up to 80% faster execution time by utilizing all CPU cores effectively

Lockd - BigRed//Hacks Finalist and Beginner's Prize | *React Native, Flask, Typescript, Python* — Oct. 2024
- Assembled a smart lock system, integrating React with RESTful Flask APIs to create a companion mobile app, enabling remote control and break-in detection, winning Finalist and Beginner's Prize among 41 teams and 140+ competitors
- Configured Raspberry Pi with shock and sound sensors, triggering push and email notifications upon suspicious activity

Ear Trainer | *Next.js, Prisma, PostgreSQL, TailwindCSS, Figma, Typescript* — Jul. 2024 – Sep. 2024
- Developed a full-stack Next.js web application for ear training, using VexFlow and Tone.js to display and play dynamically generated, interactive music exercises across 10 grade levels, and Lucia for user authentication and authorization
- Integrated PostgreSQL with Prisma ORM for efficient relational data management and user progress tracking