Tailai Ying

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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, XML
Web and App Development: React, React Native, Next.js, Angular, TailwindCSS, Node.js, Flask, Spring Boot, Prisma, PostgreSQL, Figma, Postman, GitHub Actions
AI/ML and Robotics: PyTorch, OpenCV, NumPy, PyBullet, MyoSuite, MuJoCo, Gymnasium

Experience

Research Assistant — May 2025 – Present
EmPRISE Lab, Cornell University — *Ithaca, NY*

- Developed LLM-powered caregiving robot system reducing manual configuration time by 75% while enabling personalized care for mobility-limited patients
- Engineered reinforcement learning pipeline integrating MyoSim musculoskeletal models with custom MyoSuite/MuJoCo environment with Gymnasium wrapper for real-time patient biomechanics adaptation
- Designed comprehensive robot controller training framework supporting individualized patient care protocols

Research Intern — May 2025 – Present
Aria Lab, University of Utah — *Salt Lake City, UT*

- Architected 3D swarm robotics simulation platform in PyBullet with custom drone physics, sensor models, and automated data processing pipeline
- Discovered 15+ emergent collective behaviors by augmenting platform with custom novelty search and k-medoids clustering algorithm
- Created scalable research framework enabling rapid prototyping of multi-agent coordination algorithms

Technical Lead — Jan. 2025 – Present
CommuniCare — *Ithaca, NY*

- Led healthcare platform development for startup that raised $32,000+ and secured hospital partnerships across greater NY area
- Managed 8 member engineering team implementing full-stack React/Flask solution, establishing Agile workflows and CI/CD pipeline
- Streamlined development productivity through systemic sprint planning and automated deployment processes

CS Subteam Member — Feb. 2024 – Present
Cornell Autonomous Drone — *Ithaca, NY*

- Integrated stereo visual odometry with YOLOv10 object detection, achieving 95% localization accuracy for autonomous navigation
- Developed real-time trajectory planning system using OpenCV to calculate target distances and optimal flight paths

Tutor — Jun. 2025 – Present
Freelance — *Remote*

- Accelerated learning outcomes for 2 students delivering personalized AMC competition math and CS fundamentals instruction
- Created customized curriculum with targeted practice materials resulting in measurable performance improvements

Projects

CritterEvo | *Java* — Dec. 2024 – Feb. 2025

- Built complex ecosystem simulator with evolving entities on a procedurally generated cell world, demonstrating natural selection
- Implemented neural network with NEAT genetic algorithm from scratch, integrating A* pathfinding for intelligent behavioral adaptation
- Achieved over 80% performance improvement through multithreading, lazy loading and caching strategies, supporting over 2M+ cell world size and 500+ entity count
- Developed comprehensive JUnit test suite with 800+ lines of code ensuring robust functionality across edge cases

Lockd - BigRed//Hacks Finalist and Beginner's Prize | *React Native, Flask, Python* — Oct. 2024

- Won top 5 placement among 41 teams and 135 competitors with innovative IoT smart lock security solution
- Engineered end-to-end system integrating React Native mobile app, Flask, and Raspberry Pi hardware for real-time threat detection
- Implemented multi-modal sensing with shock/sound detection triggering instant push and email notifications

Ear Trainer v2 | *Spring Boot, Angular, VexTab, Tone.js, PostgreSQL, TypeScript* — Jun. 2025 - Jul. 2025

- Developed full-stack music learning platform generating infinite exercise variations across 10 grade levels aligned with RCM standards
- Implemented real-time music notation rendering and audio synthesis with VexFlow and Tone.js
- Built secure user system with bCrypt authentication and PostgreSQL for progress tracking supporting personalized learning paths

OCaml Web Server | *OCaml, Lwt* — Mar. 2025 - May 2025

- Developed concurrent HTTP server handling 1000+ simultaneous requests with modular RESTful API architecture
- Engineered persistent CSV-based database system supporting full CRUD operations with CSV-based storage and JSON processing
- Achieved over 95% line coverage through comprehensive OUnit2 test suites with 67 test cases ensuring production-ready reliability