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 Intern — May 2025 – Present
Aria Lab, University of Utah — *Salt Lake City, UT*
- Architected 3D swarm simulation framework in PyBullet with custom drone models, binary sensors, unicycle controller models, and automatic data collection and processing
- Implemented novelty search and k-medoids clustering algorithms to systematically categorize swarm behaviors, discovering 15+ emergent collective behaviors

Research Assistant — May 2025 – Present
EmPRISE Lab, Cornell University — *Ithaca, NY*
- Developed LLM-based patient controller initialization system for caregiving robots, reducing manual configuration time by over 75% while supporting individualized care for mobility-limited patients
- Engineered reinforcement learning pipeline leveraging MyoSuite's musculoskeletal models, enabling real-time adaptation of robot controllers to individual patient biomechanics with over 90% accuracy

Technical Lead — Jan. 2025 – Present
CommuniCare — *Ithaca, NY*
- Spearheaded full-stack development of healthcare access platform using React and Flask in a 20+ member startup team, raising over $32,000 in initial seeding rounds and partnering with hospital system across the greater NY area
- Established Agile methodology with weekly sprints and configured GitHub Actions CI/CD pipeline, greatly streamlining team productivity and deployment time

CS Subteam Member — Feb. 2024 – Present
Cornell Autonomous Drone — *Ithaca, NY*
- Integrated custom-made stereo visual odometry algorithms using OpenCV with YOLOv10 object detection to calculate real-time target distances and trajectory planning, achieving over 95% localization accuracy for autonomous navigation

Tutor — May 2025 – Present
Freelance — *Remote*
- Accelerated learning outcomes for 2 students by delivering personalized AMC competition math and CS fundamentals instruction with customized study materials and targeted practice

Projects

CritterEvo | *Java* — Dec. 2024 – Feb. 2025
- Constructed artificial life simulator with individual evolving entities on a procedurally generated grid-based world, demonstrating natural selection through 1000+ generations of behavioral adaptation
- Implemented neural network with NEAT genetic algorithm from scratch, and optimized pathfinding with the A* search algorithm
- Leveraged multithreading, lazy loading, and caching to achieve over 80% performance improvement, supporting 500+ critters and a world size greater than 2 million cells
- Designed robust JUnit black box and glass box test suite with 800+ lines of code to validate functionality across edge cases

Lockd - BigRed//Hacks Finalist and Beginner's Prize | *React Native, Flask, Python* — Oct. 2024
- Developed award-winning smart lock system integrating React Native mobile app with Flask APIs, winning Finalist and Beginner's Prize among 41 teams (140+ competitors)
- Configured Raspberry Pi with shock and sound detection, triggering instant push and email notifications upon of suspicious activity

Ear Trainer v2 | *Spring Boot, Angular, VexTab, Tone.js, PostgreSQL, TypeScript* — Jun. 2025 - Jul. 2025
- Engineered full stack music education platform with VexTab and Tone.js, generating infinite exercise variations across 10 grade levels aligned with 2022 RCM Piano Syllabus
- Implemented secure user authentication with bCrypt password hashing and progress tracking with PostgreSQL integration

OCaml Web Server | *OCaml, Lwt* — Mar. 2025 - May 2025
- Architected thread-safe HTTP server with RESTful API in OCaml, featuring modular routing architecture handling 1,000+ concurrent requests with JSON parsing and response generation
- Engineered persistent CSV-based database system supporting full CRUD operations and achieved 95% line coverage through comprehensive OUnit2 test suite across 67 test cases