Tailai Ying

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Education

College of Engineering, Cornell University — Ithaca, NY
B.S. in Computer Science — *Aug. 2023 – May 2027*

Coursework

Intro CS: Design and Development, 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, OCaml, Verilog
Web and App Development: Next.js, React, Express, Flask, Node.js, TailwindCSS
Tools and Technologies: Git, GitHub Actions, Figma, Postman, Prisma, PostgreSQL
Machine Learning and Computer Vision: PyTorch, TensorFlow, OpenCV

Experience

Research Intern — Incoming May 2025
Aria Lab, University of Utah — *Salt Lake City, UT*
- Extending two-dimensional swarm robot behavior to discover novel three-dimensional swarm behavior for use in drones

Technical Lead — Jan. 2025 – Present
CommuniCare — *Ithaca, NY*
- Developed full-stack web application with React and Express as technical lead, connecting 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
- Conducted code reviews and mentored team in design/development best practices to maintain codebase integrity and scalability
- Configured GitHub Actions CI/CD pipeline, automating deployment processes and streamlining team workflow

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 Python scripting, reducing manual processing time by more than 50%

Projects

CritterEvo | *Java* — Dec. 2024 – Feb. 2025
- Built an artificial life simulator with genetic inheritance and mutation to simulate natural selection and evolution
- Developed a procedurally generated terrain system using Simplex Noise for environmental realism and diversity
- 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 and servo for intrusion detection, triggering push and email notifications upon suspicious activity

Ear Training App | *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, and Lucia for user authentication and authorization
- Integrated PostgreSQL with Prisma ORM for efficient relational data management and user progress tracking