Tailai Ying

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Education

College of Engineering, Cornell University — Ithaca, NY
B.S. in Computer Science, GPA: 3.5 — *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

Experience

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

- Captured and labeled over 2000 frames in image data with Raspberry Pi to prepare for model training
- Deployed the YOLOv10 model to achieve 46% less latency and 25% fewer model parameters in object detection
- Utilized OpenCV to employ visual odometry techniques for drone navigation and spatial awareness
- Ran custom inference models onboard Sony's IMX500 Sensor for object detection

Projects

CritterEvo | *Java* — Dec. 2024 – Present

- Developed an artificial life simulator to model natural selection and critter behavior in a dynamic environment
- Created a grid-based procedurally generated world using Simplex Noise for terrain and environmental diversity
- Designed critters with diverse traits, adding genetic inheritance and mutation to model evolution over generations
- Implemented the A* search algorithm for path finding, enabling critters to locate resources efficiently
- Implemented the NEAT genetic algorithm to dynamically evolve critters' neural network for emergent behavior
- Applied evolutionary game theory principles for decision-making during resource conflicts and combat resolution
- Emphasized clean, maintainable, and modular code with a focus on system design and effective class relationships
- Wrote a robust JUnit black-box test suite to validate functionality and maintain consistency across edge cases

Lockd: BigRed Smart Lock | *React Native, Flask, Typescript, Python* — Oct. 2024

- Finished as Finalists and won Beginners Prize out of 41 teams and 140+ competitors for BigRed//Hacks
- Co-developed a motorized smart lock system with remote control and break-in detection
- Developed and integrated a full-stack React and Flask mobile application with lock system for user convenience
- Linked app with Pi sensors to trigger push and email notifications when detecting suspicious activity
- Implemented remote control functionality, allowing users to remotely lock, unlock, and monitor the lock system

Ear Training App | *Next.js, Prisma, TailwindCSS, Figma, Typescript* — Jul. 2024 – Sep. 2024

- Developed a comprehensive full-stack web application for ear training based upon the 2022 RCM Piano Syllabus
- Designed and implemented aural exercises with VexFlow and Tone.js for training across 10 grade levels
- Added username and password authentication and authorization with Lucia
- Integrated a relational database with Prisma to store user data and track progress over time

Technical Skills

Languages: Java, Python, SQL, JavaScript, Typescript, HTML/CSS
Frameworks: React, Node.js, Flask, Next.js, Bootstrap, TailwindCSS
Tools: Git, Prisma, Figma, Postman
Libraries: TensorFlow, OpenCV

Awards and Achievements

BigRed//Hacks Finalist, BigRed//Hacks Beginners Prize, National Merit Scholar, 2-time AIME qualification