David Chen

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GitHub | Personal Website

Education Background

Georgia Institute of Technology — Atlanta, GA
Bachelor of Science in Electrical Engineering — Expected May 2028
Dual Degree Engineering Program

Emory University — Atlanta, GA
Bachelor of Computer Science and Mathematics | Dean's List — May 2025
Cumulative GPA: **4.0/4.0**

Research Interest

Deep Reinforcement Learning & Imitation Learning in Robotics

Project Experience

Behavioral Cloning for Collision-Free Panda Arm Trajectories | GitHub — 2025 Summer
Tools: Python, ROS, MoveIt, PyTorch | Independant Study

- Built a behavioral cloning agent for the Franka Emika Panda arm to generate collision-free trajectories in a cluttered environment, using expert demos from MoveIt;
- Implemented data generation pipeline in ROS: randomized obstacles and target, validated inverse kinematics, planned trajectories, and extracted observations;
- Trained a PyTorch MLP network (2x256 hidden layers) mapping observations to joint increments, with action scaling and normalization.

Deep Reinforcement Learning for Mobile Robot Navigation | GitHub — 2025 Summer
Tools: Python, PyTorch, MuJoCo, SB3

- Reproduced the Adversarial Inverse Reinforcement Learning (AIRL) method from Fu et al. (ICLR 2018);
- Trained SAC expert agents in 4 benchmark environments using SB3 and collected expert rollouts;
- Implemented AIRL in PyTorch: build discriminator with reward g(s,a) and shaping network h(s), adversarially training against the policy to recover reward functions;
- Demonstrated that the learned rewards correctly distinguish expert vs random behavior (e.g. Bipedal: 5390 ± 159 for expert vs. -23215 ± 20535 for random) .

Autonomous Car with Collision Prediction | GitHub — 2025 Summer
Tools: Python, PyTorch, MuJoCo

- Implemented the collision-prediction probability (CPP) module described in Zhang et al. (2021);
- Custom-modeled a MuJoCo environment with a differential-drive car and randomized obstacles;
- Built a data collection pipeline that generated 272k labeled samples, each including LiDAR range readings and velocity states;
- Trained a 3-layer PyTorch MLP, achieving strong performance (validation loss ≈ 0.0835, recall ≈ 0.998, F1 ≈ 0.49);
- Integrated the CPP model into a SAC model to provide risk-sensitive reward shaping for autonomous driving.

Neural Network for Mpox Diagnosis — 2024 Fall
Tools: Python, Django, Scikit-Learn, TensorFlow

- Trained a neural network utilizing data from 25,000 Mpox patients to develop an Mpox detection system;
- Conducted data preprocessing by handling missing values, standardizing binary values, and implementing OneHotEncoding;
- Implemented and tuned a neural network architecture with 4 layers, achieving a notable accuracy of 88% in diagnosing Mpox.

Internship Experience

Curastone | Software Developer Intern — Sep.2023-Dec.2023

- Developed an AI-learning assistant that generates flashcards and personalized exercises using TypeScript and Next.js;
- Implemented user authentication, file upload, and course management, integrated with backend API using Redux;
- Designed responsive webpages using Tailwind CSS to ensure proper display of elements on various screen sizes;
- Deployed website using Vercel and AWS Route 53 and documented the deployment process for future reference.

Extracurricular Experience

Emory Center for AI Learning | Project Leader Jan.2025-May.2025

- Engineered a domain-specific medical chatbot in collaboration with MedView to answer device-related questions;
- Developed a React + TypeScript frontend supporting both text and voice interaction using the Web Speech API;
- Built a FastAPI backend to query the DeepSeek API, with semantic caching using Sentence Transformers and FAISS for low-latency FAQ retrieval from a predefined MongoDB database;

Emory Robotics Club | Programming Team Member Sep.2024-May.2025

- Built and programmed the VEX V5 Classroom Starter Kit robot as a foundation for autonomous and driver control;
- Developed motion code using the PROS C++ library for the 2025 VEX "High Stakes" competition;
- Implemented path-planning logic and tuned PID controllers for drivetrain and lift stability.

Emory Goizueta Business School | AI Research Assistant Jan.2024-May.2024

- Developed a full-stack video analytics platform with Next.js frontend and a SpringBoot backend (42+ REST APIs);
- Deployed backend and database on Linux-based AWS EC2 instances, configured network settings to enable remote access;
- Designed database schema and automated data transfer from local development to Linux server using Bash scripts;
- Developed a video content similarity model using AWS Rekognition for object detection, ChatGPT-4 + SpaCy for transcript-based semantic analysis.

Technical Skills

Robotics & Simulation: Robot Operating System (ROS1), MuJoCo, MoveIt, PyTorch, Scikit-learn, Stable-Baselines3 (SB3)
Programming Languages: Python, Java, C, C++, SQL, JavaScript
Systems & Tools: Linux, Git, VMWare, Amazon Web Services, Google Cloud Platform