

David CHEN

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[GitHub](#) | [Personal Website](#)

EDUCATION BACKGROUND

Georgia Institute of Technology BS in Electrical Engineering Dual Degree Engineering Program	Atlanta, GA Expected May 2028
Emory University BS in Computer Science and Mathematics Dean's List Cumulative GPA: 4.0/4.0	Atlanta, GA May 2025

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 | Independent Project
- 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: built 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