Eric Zhao

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Education

Carnegie Mellon University

M.S. in Artificial Intelligence Engineering – GPA: 4.0/4.0 **May 2025**

B.S. in Mechanical Engineering, Additional Major in Chinese Studies – GPA: 3.78.0/4.0 **May 2024**

Courses (Graduate): Machine Learning, Introduction to Deep Learning, Intermediate Deep Learning, Numerical Methods, Trustworthy AI Engineering, Data Structures and Algorithms, Engineering Computation, Dynamic Systems & Controls

Projects

Imitation and Reinforcement Learning for Prosthesis & Exoskeleton Control **Dec 2024 - Present**

- Developing deep learning pipeline for lower leg prosthetic & robotic hip exoskeleton assisted human walking in **MuJoCo**
- Trained humanoid locomotion models using both **GAIL** and **VAIL** imitation learning frameworks in **LocoMuJoCo**
- Evaluating performance of different model-based & model-free RL control architectures (**Transformer RL, MLP, Twin Delayed DDPG, PPO**)

Multi Agent Reinforcement Learning with LLMs for Safe Path Planning **Aug 2024 - Present**

- Designed semantic reasoning and context-aware obstacle classification method by integrating GPT-4 with state-of-the-art **Multi-Agent Reinforcement Learning** (MARL) framework, achieving **94% accuracy** in severity classification
- Programmed Rapidly-Exploring Random Trees (**RRT**) based planning algorithm with **LLM**-guided penalties, improving safe navigation around obstacles by **80%** with reinforcement learning using **OpenRL** and **Pytorch** libraries
- Conducted large-scale reinforcement learning training in NVIDIA's **IsaacGym**, processing over 100M steps across 500 parallel environments on NVIDIA GPUs, achieving robust obstacle avoidance and reliable trajectory generation
- Demonstrated **14% improvement** in safe navigation for high-severity hazards compared to traditional frameworks

FIFA Soccer Player Analytics and Predictive Modeling **Sep 2024 - Dec 2024**

- Ingested and consolidated **100K+** player records from FIFA datasets (2015-2022) into a **PostgreSQL** database with schema alignment, unique identifiers, and added features for year-based analytics
- Engineered scalable Python functions to analyze player contracts, average team ages, and nationalities, handling complex scenarios like tied ranks and invalid inputs
- Achieved **95% accuracy** in predicting player overall value using a **Random Forest Regressor** on engineered features
- Compared performance across **Spark**, **PyTorch**, and **TensorFlow** frameworks with deep and shallow neural networks

Research

CERLAB (Computational Engineering & Robotics Lab) **May 2021 - Present**

Latticed Prosthetic Liners Project

- Developing printable anisotropic latticed prosthetics for transfemoral amputees using in-lab mesh generation software
- Implemented **KNN Regressor** algorithm using **Sklearn** and **Pandas** to predict a 3D model's stress distribution from sample finite element simulation data, with over **90% accuracy** to stress data collected from user
- Wrote Python script to automate the conversion of 3D stress distribution point cloud into an associated tensor field

Leadership & Awards

Carnegie Mellon University **Rales Fellow** (Graduate Fellowship, ∼**90k/yr, 1 year**) **2024 – Present**

Carnegie Mellon University **Tartan Scholar** (High Achieving Student Leaders) **2020 - Present**

Carnegie Mellon University Food Pantry Lead Coordinator **2021 - Present**

Gates Scholarship Cohort III (Full Ride Undergraduate Scholarship) **2020 - 2024**

Carnegie Mellon University College of Engineering's **Dean's List (6X)** **2020 - 2024**

Skills

Programming Languages: Python, C++, C, SQL, MATLAB, LaTeX

Tools: GCP, AWS, Github, Docker, Wandb, Gymnasium, MuJoCo, IsaacGym, PostgreSQL, Apache Kafka

Frameworks: PyTorch, TensorFlow, NumPy, SciPy, scikit-learn (Sklearn), Pandas, Matplotlib, PySpark, Django