Yuqi Xie

1859 Shirley Ln Apt B7, Ann Arbor, MI, 48105

734-510-4285 xieleo@umich.edu xieleo5.github.io

Education

University of Michigan, Ann Arbor **Sep. 2021 – Apr. 2023**

Bachelor of Computer Science - College of Engineering *Michigan, U.S.*

- Highlighted Courses: Machine Learning, Deep Learning for Computer Vision, Operating System, Web Systems
- Research Interests: Reinforcement Learning, General-purpose agents, Foundation Models, Multimodal Learning, Robotics
- GPA: 3.96/4.0

Shanghai Jiaotong University **Sep. 2019 – Aug. 2023**

Bachelor of Electrical and Computer Engineering - UM-SJTU Joint Institute *Shanghai, China*

Research Experience

Collaboration with NVIDIA and UT Austin **April 2022 - Present**

Undergraduate Research Assistant | Advised by Prof. Yuke Zhu, Dr. Linxi "Jim" Fan *Remote*

- **Development For MineDojo2**

  MineDojo is a framework built on the popular *Minecraft* game that features a simulation suite with thousands of diverse open-ended tasks and an internet-scale knowledge base. My contributions on updating infrastructure include:
  - Dramatically modify the infrastructure, make the interface more research friendly and the environment more scalable for training a large-scale open-ended agent.
  - Implement a plugin to support a universal computer using interface, in specific, keyboard and mouse input, instead of cheating commands for an agent to finish zero-shot tasks like a human.
  - Increase the observation data transition speed between the game and the agent by 2x based on grpc protocol.
  - Enable GPU acceleration for the rendering process of *Minecraft* game inside Docker containers used for training.
- **Embodied AI agent based on MineDojo2**

  We aim to build a general-purpose embodied agent that can finish a wider range of zero-shot tasks under various circumstances in the game based on MineDojo2 framework. My contributions include:
  - Create benchmark task suites using the state-of-the-art OpenAI Video-PreTraining model.
  - Apply internet-scale pre-trained models on 300K Youtube videos in MineDojo to retrieve expert actions from human operations as data for large-scale training.
  - Experiment with large-scale multi-modal Transformers on zero-shot human language driving *Minecraft* tasks.

SOCR MDP Team **Winter and Fall Semester, 2022**

Undergraduate Research Assistant | Advised by Prof. Ivo D. Dinov, Prof. Simeone Marino *University of Michigan*

- **Datasifter–Sensitive Information Obfuscator**

  Datasifter is an obfuscator to prevent patients' sensitive information to be leaked from Hospital databases. The obfuscation is based on Machine Learning and Natural Language Processing technologies. My contributions includes:
  - Experiment with pre-trained NLP models and ML metrics to implement the obfuscation part.
  - Implement a script based on ML metrics to evaluate the effectiveness of data synthesis and data obfuscation.
  - Improve the speed of the app by 10x by applying multi-thread programming.

Projects

Probing into the Reason behind Wasserstein GAN's Success | *Machine Learning Course Project* **Fall Semester, 2021**

- Implement Wasserstein in Generative Adversarial Network, as well as WGAN with gradient penalty.
- State the problem of the original GAN loss function and analysis the modifications made by WGAN mathematically.
- Train WGAN on three datasets: LSUN Bedroom, CelebA, and Animefaces. Compare the stability of WGAN's loss function with the widely-used DCGAN using FID scores.

Arceus–Pokemon Gold Gym Environment | *Personal Project* **Winter Semester, 2022**

- Build the Gym environment for traning agents to play the *Pokemon* game using keyboard inputs.
- Implement several RGB wrappers for data augmentation to train a robust agent.
- Scale-up the training environment by applying multi-processing, increase the total throughput by 5x.

Technical Skills

Skills: Reinforcement Learning, Training Infrastructure Development, Computer Vision, Natural Language Processing
Software and Libraries: Gym, Ray, Tianshou, Docker, Pytorch, Gradle, Selenium, Mixin, GRPC, Unity, Unreal
Programming Language: Python, Java, JavaScript, C++, C#