

# Yuqi Xie

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## Education

### University of Michigan, Ann Arbor

Sep. 2021 – Apr. 2023

Bachelor of Computer Science - College of Engineering

Michigan, U.S.

- Highlighted Courses: Machine Learning, Computer Vision, Operating System, Web Systems, XR Development
- Research Interests: Reinforcement Learning, Embodied agents, Foundation Models, Multi-modal Learning, Robotics
- GPA: 3.96/4.0

### Shanghai Jiao Tong 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 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 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 using on grpc protocol.
- \* Enable GPU acceleration for the rendering process of *Minecraft* game during training inside Docker containers.

#### • 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 baseline 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 training 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#