

# Mo Xu

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## EDUCATION

### University of Michigan - Ann Arbor

MI, United States

Master in EECS track Data Science & Machine Learning - GPA:3.7

Sept 2022 – Dec 2023

### Dalian University of Technology

Dalian, China

BEng in Electrical Engineering - GPA:3.5

Sept 2018 – June 2022

## TECHNICAL SKILLS

**Programming:** Python, MATLAB, C++/C, SystemVerilog, Bash, SQL

**Interests:** Robot Crowd Navigation, Reinforcement Learning, MPC, Human-Robot Interaction, CV

**Technologies/Frameworks:** Git, Linux, ROS2, AWS, PyTorch, Tensorflow, CVXPY, Gymnasium, openCV

## PROFESSIONAL EXPERIENCES

### Research Assistant @ University of Michigan

Fluent robotics lab

Sep 2023 – Present

- Detect 3D human positions and skeletal keypoints via YOLOv8, RGB-D camera, and point clouds.
- Establish a real-time pipeline to predict human future trajectories via scene transformer.
- Deploy social navigation algorithm with topological model predictive control to avoid pedestrians.

### Research Assistant @ Westlake University

I4FSI Lab

April 2023 – Aug 2023

- Designed the swimming modules of an amphibious quadruped 12-DOF robot.
- Established raspberry Pi 4B python environment with socket, servos, and IMU interfaces.
- Utilized SOTA reinforcement learning model Proximal Policy Optimization(PPO) for control.
- Established a customized RL environment based on Gym.Env with socket connection to the Robot.

### ABB Engineering (Shanghai) Ltd.

Intern, Electronics department

June 2021 – Aug 2021

- Utilized C language in PID control of the high voltage power supply of robots.

## SELECTED PROJECTS

### Kalman Filter vs. Particle Filter in Pybullet

Algorithmic Robotics Course

Aug 2023 - Nov 2023

- Implemented motion planning and perception algorithms: A\*, RRT, PCA, RANSAC and ICP.
- Compare the performance of Kalman Filter and Particle Filter with PR2 robot simulation in Pybullet.

### Lidar and Visual SLAM Loosely-Coupled Fusion

Mobile Robotics Course

Jan 2023 - April 2023

- Utilized ORB-SLAM3 to calculate robot rotation and translation with loop closure detection.
- Convert the 3D points cloud into rotation and translation matrix by LITAMIN2 LiDAR SLAM.
- Loosely coupled Visual and LiDAR SLAM by modifying data prior.

### Predicting Music Popularity Based on Extracted Instrumental Features

Machine Learning Course

Jan 2023 - April 2023

- Implementation: Linear/Logistic Regression, Naive Bayes, PCA, ICA, SVM, CNN, RNN, etc.
- Searched and downloaded 45000+ songs on the Google Cloud by multithreaded Python scripts and extracted Mel-spectrograms by librosa to manually extract features.
- Utilized the Transformer on Tensorflow and ResNet to classify the popularity with the extracted Mel-spectrograms but found the low correlation between popularity and spectrograms.

### Design an Experiment of Auto Vehicle Algorithm Bias in Trolley Problems

Ethics for AI and Robotics Course

Jan 2023 - April 2023

- Designed an experiment to obtain people's preferences on virtual trolley problems.
- Proposed the algorithm bias strategy to satisfy major preferences of people.