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 skeletal keypoints via YOLOv8.
- Track human 3D positions from images and point clouds then match with skeletal keypoints.
- Establish a real-time pipeline to predict human future trajectories via transformer.

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

Lidar and Visual SLAM Loosely-Coupled Fusion
Mobile Robotics Course Project 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 Project Jan 2023 - April 2023

- Classified Spotify songs' popularity from pre-extracted features by machine learning algorithms.
- 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 with 500000+ parameters and ResNet CNN to classify the popularity with the extracted Mel-spectrograms but found the low correlation with spectrograms.

Design an Experiment of Auto Vehicle Algorithm Bias in Trolley Problems
Ethics for AI and Robotics Project 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.

Research on Bearing Fault Diagnosis Method Based on Granular Model
Undergraduate Project Jan 2022 - June 2022

- Pre-processed raw data via wavelet packet threshold and information granulation analysis.
- Established Pytorch convolutional self-encoder(CNNs) to extract the main information features.