Mo Xu

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Education

University of Michigan -Ann Arbor MI, United States
Master in EECS track Data Science & Machine Learning Sept 2022 – Present

- GPA: 3.7
- Main modules: Machine Learning, Mobile Robotics, Probability & Random Processing, Computer Architecture

Dalian University of Technology Dalian, China
BEng in Electrical Engineering Sept 2018 – June 2022

- GPA: 3.5
- Main modules: Intelligent Algorithms, Modern Control Theory, Programmable Controller

Programming: MATLAB, Python, C++/C, SystemVerilog, Bash, SQL
Personal Page: https://alfredmoore.github.io/ **Github**: https://github.com/AlfredMoore?tab=repositories

Experiences

Reinforcement Learning Control of Amphibious Quadruped Robot
Intern, I4FSI Lab, Westlake University April 2023 – Aug 2023

- Designed and 3D-printed the swimming modules of an **amphibious quadruped robot** with 12 degrees of freedom, 4 flippers and a buoyancy module.
- Established raspberry Pi 4B **python** environment with socket connection with PC, servos control interface on the GPIO and IMU interface on the I2C.
- Utilized the deep reinforcement learning model, **Proximal Policy Optimization**(**PPO**) with extra tricks, to improve performance.
- 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 to control the high voltage power supply of robots, with **PID** for stability.
- Established a database to record the amount of components, and added 1000+ records.

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

- Utilized **ORB-SLAM3** to detect, extract and compare ORB features from images and calculated rotation and translation information with the optimization of loop closure detection.
- Convert the 3D points cloud into rotation and translation matrix by **LITAMIN2** LiDAR SLAM.
- Loosely coupled visual and LiDAR SLAM by checking bad data and replacing it with good data.

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, such as **logistic regression**, **SVM**, **XGboosting**, **random forest** and **fully connected neural network**.
- Searched and downloaded **45000+** songs on the **Google Cloud** by **multithreaded Python** scripts and extracted Mel-spectrograms by **librosa** to manually extract features and establish the dataset.
- 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.

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

- Used wavelet packet threshold to denoise the original signal on **MATLAB**
- Applied **NumPy** information granulation analysis to obtain the main information on Python
- Established **Pytorch** stacked convolutional self-encoder(**CNNs**) to extract the main information features and achieved accuracy higher than 98% and visualization with **matplotlib**.
- Utilized **Scikit-learn** unsupervised learning **K-Means** to classify the feature.