

## EDUCATION

---

### NATIONAL UNIVERSITY OF SINGAPORE

Singapore

*Master of Engineering in Department of Mechanical Engineering (expected graduation Jun. 2023)*

Jul. 2021 – Present

- GPA 4.33/5
- Research focus on Robotics, **Deep Reinforcement Learning**, **Multiagent Path Planning**

### HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Wuhan, China

*Bachelor of Engineering, Mechanical Design Manufacture and Automation*

Sep. 2017-Jun. 2021

- GPA 3.5/4 Second class Honour
- Third-class Prize, “Aichi Cup” Formula Student Autonomous China (FSAC) November 2019
- Award of Excellence, Formula Student Combustion China (FSCC) October 2018

## EXPERIENCE

---

### Multiagent Resilient Search via Deep Reinforcement Learning

Singapore

*Research Student*

Nov. 2022 – Present

- Design decentralized multiagent search policy for omni wheels robot.
- Solving Dec-POMDP problem of minimizing the capture time in an unknown environment with the idea of CTDE
- Comparing the results of multiagent reinforcement learning algorithms such as VDN, Qmix with classical search methods such as FHPE and MILP.
- Taking into the consideration of faulty rates of robots by training with dynamic numbers of agent in each episode.

### Multiagent Reaction Control in Human involved Environment via Deep Reinforcement Learning

Singapore

*Research Student*

Apr. 2022 – Oct. 2022

- Design decentralized multiagent control system for AGVs in human involved warehouse environment.
- Solving POMDP problem for navigation and unpredictable dynamic obstacle avoidance.
- Using pybullet as 3D simulation environment, Solidworks as modelling and robot kinematic defining.
- Conduct training on the combination of imitation learning and deep reinforcement learning.
- Complete the overall control based on both conventional paths planning approach and learning based reaction policy.

### Truck Trailer trajectory generation via Deep Reinforcement Learning

Continental Singapore

*AI Function Engineer Intern*

May. 2022 – Apr. 2023

- Devise a mid-end controller for truck trailer system based on hybrid deep reinforcement learning.
- Enabling autonomous tractor to drive safely in reaction to its current situation and plan short trajectories for the future
- Using pybullet as simulation environment, Open-AI gym framework and manually craft vehicle and lane models.
- Devise solution based on the combination of imitation learning and deep reinforcement learning.
- A paper to be submitted to ITSC 2023

### Bipedal Walker controlling via Deep Reinforcement Learning

Singapore

*Group Member*

Jul. 2021 – Dec. 2021

- Design a robot model with 12 Dofs in Pybullet environment, register it in gym and using DRL approach to train it to walk.
- Apply different algorithms: PPO, DDPG, TD3 to train the agent, compare their results and make evaluation.

### Image Style Conversion and Image Processing based on Deep Learning Technology

Shanghai, China

*Part-time Assistant*

Jun. 2020 – Aug. 2020

- Apply the basic knowledge of deep learning, machine learning, convex optimization, and other fields, and investigate on global research status of machine learning.
- Carry out mathematical derivation of common machine learning models, and build related models by TensorFlow and Python, then analyse the advantages and disadvantages of deep learning models.
- Use convolutional Auto-Encoders for image denoising and train the model on MINIST data set.

**Autonomous Formula Racing Car Team of HUST**

Wuhan, China

*Leader & Chief Designer in a team of over 60 students*

Jan. 2019 – Jan. 2020

- Responsible for team management including the project's progress control, getting sponsorship, and the structure design of the system framework and lead the team to win national third prize.
- Perform targets detection via LiDAR; clustered and restored the buckets on the control interface through a clustering algorithm based on the collected point cloud information in Robot Operating System.
- Design the algorithm that plan the trajectory for vehicle based on the control condition and use the PID controller as lower layer controller to stabilize the car.

**SKILLS AND ACTIVITIES**

---

- Programming Languages: Proficient in Python and Matlab, Elementary in C++
- Have a good understanding of machine learning, especially deep reinforcement learning and knowledge in path planning, robot control and autonomous driving
- Have experience with Linux OS (ubuntu 20.04), ROS and tensorflow2 structure, gym framework, pybullet simulation environment, git
- Communication: Proficient in English and native in Mandarin

**ADDITIONAL INFORMATION**

---

Second year Master of Engineer student in the two-year program of Mechanical Engineering at NUS Engineering School.  
Focused Interests on Deep Reinforcement Learning in Robotics, Multiagent Path Planning, Vehicle Manipulation.

Proficient knowledge in Machine Learning, especially Deep Reinforcement Learning algorithms, such as PPO, A3C, VDN, Qmix, MADDPG and Autonomous Vehicle Control Strategy.