Gao Ziteng, Michael

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EDUCATION

National University of Singapore (NUS) Aug 2022 - Sep 2023
Master, Mechanical Engineering Singapore
Harbin Institute of Technology (HIT) Aug 2018 - Jun 2022
B.Eng. Mechatronic Engineering Harbin, Heilongjiang, China
NUS (Suzhou) Research Institute (NUSRI) Sep 2021 - Jun 2022
A educational collaboration by NUS and HIT Suzhou, Jiangsu, China
University of Pennsylvania Jan 2019 - Feb 2019
Exchange Program Philadelphia, USA

WORKING EXPERIENCE

Algorithm Engineer Dec 2023 - Present
Decision&Planning, XPENG Motors Guangzhou, Guangdong, China

- Design and optimize Xplanner(XPENG Motors self-developed planning model)
- RL fine-tune planning model outputs
- Design an interactive game-theoretic algorithm for vehicle interactions, enabling better decision-making in complex traffic scenario
- Optimize behavior planning and motion planning algorithms for autonomous vehicle, including behavior design and speed planning

Algorithm Engineer Oct 2023 - Dec 2023
Planning, Intern at Starj.ai Guangzhou, Guangdong, China
Starj.ai

- Implement several path tracking methods, including pure pursuit and MPC
- Camera calibration on ros2 humble
- Trying open-source autolabing method (GroundinDINO + SAM)

PUBLICATION

[1] **Gao, Z**., Qu, J., & Chen, C. (2025). A Hybrid Input based Deep Reinforcement Learning for Lane Change Decision-Making of Autonomous Vehicle.

[2] Wang, Y., Xu, X., **Gao, Z**., & Shi, X. (2021, December). A Prior Probability of Speaker Information and Emojis Embedding Approach to Sarcasm Detection. In 2021 IEEE International Conference on Engineering, Technology & Education (TALE) (pp. 1033-1038). IEEE.Published

PROJECT EXPERIENCE

A Hybrid Input based Deep Reinforcement Learning for Lane Change Decision-Making of Autonomous Vehicle Sep 2022 - Sep 2023
Supervisor: Chen Chao Yu, Peter NUS, Singapore

- A trajectory prediction of surrounding vehicles is realized by a transformer network. The prediction results are combined into the state space of reinforcement learning to implicitly model the vehicle interaction impact on ego vehicle in traffic flow
- A deep reinforcement learning model is designed to fully use the hybrid environmental observation which includes low-dimensional data from basic sensors and high-dimensional image from RGB camera
- The lane change decision model based on deep reinforcement learning (Hybrid-PPO) is proposed, which combine with a rule-based end-to-end controller, and these achieve the entire lane change process of ego vehicles

Skills acquired: Carla, Pytorch, Transformer

Deep Reinforcement Learning Adjusting CPG Controller for Gait Transition of Quadruped robot Mar 2023 - Jul 2023

Supervisor: Guillaume SARTORETTI NUS, Singapore

- Set key parameters of CPG controller to realize multiple gaits of quadruped robot (walk, trot, run)
- Deep reinforcement learning is used to make the gait transition decision of quadruped robot, and ensure a smooth dynamic adjustment of gait combining the CPG controller

Skills acquired: Pycharm, PyBullet, Tensorflow

Motion Planning of Lane Changing of Driverless Cars Based on Reinforcement Learning Sep 2021 - May 2022

Supervisor: Chen Chao Yu, Peter NUSRI, Suzhou, Jiangsu, China

- DQN and two variants are utilized in traffic simulation software SUMO to train the reinforcement learning agent in a three-lane circular loop traffic flow to improve safety, comfort, and driving speed
- Compare the effectiveness of multiple reinforcement learning algorithms for obstacle avoidance in a simple two-lane simulation environment

Skills acquired: Pycharm, SUMO, Tensorflow

Natural Language Processing - Sarcasm Detection May 2021 - Sep 2021

Online

- Past comment sarcasm probability models of users and comment content sarcasm probability models are built to jointly detect the sarcastic sentiment of comments
- Use DeepMoji model as a controller to assist in determining the speaker's sarcastic sentiment
- Using dynamic Fischer interpolation, the sarcasm information from past comments is combined with the sarcasm probabilities from DialoGPT output

Skills acquired: Anaconda, DialoGPT, Deepmoji

'Xin Rui' Robot Competition Jul 2019 - Sep 2019

HIT, Harbin, Heilongjiang, China

- Self-assembly of vehicles, control of remote control/motors/sensors, manual remote control of vehicle movements
- Multi-sensor fusion to determine the vehicle's position, control the motor servo to adjust the vehicle's forward direction, achieve no fall, and ensure safety

Skills acquired: Sensor Fusion, Controller Design

HONORS & AWARDS

Outstanding Final Year Project awarded by NUS Jul 2022

COMAP's Mathematical Contest in Modeling S Prize (Team leader) Jan 2021

'Xin Rui' Robot Competition Second Prize awarded by HIT (Team leader) Sep 2019

SKILLS

- **Programming Language:** Python == C++ >= MATLAB
- **Softwares:** Pycharm, VSCode, MATLAB, Carla, SUMO, PyBullet
- **Platform:** Linux, Windows
- **Tools:** git for code management; Pytorch and Tensorflow for designing neural networks
- **Language:** TOEFL 95

RESEARCH PLAN

I plan to do research in the application of **reinforcement learning** algorithm

- I hope to apply **reinforcement learing** with **autonomous vehicles** or **robotics** to make reasonable **behaviour decisions**
- The potential of combining **reinforcement learing** with **rule-based control**, other ML algorithms, or with other areas like game-theory
- If you have any research orientation assigned for me, I will be very glad to accept it