Minghong Xu

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Education

University of Liverpool *Liverpool, UK*
Bachelor of Engineering in Mechatronics and Robotic Systems *Sept 2021 - June 2023 (expected)*
- Predicted to obtain First Class Honours

Xi'an Jiaotong-Liverpool University (referred to as XJTLU) *Suzhou, PR China*
Bachelor of Engineering in Mechatronics and Robotic Systems *Sept 2019 - June 2021*
- 2+2 programme cooperated with University of Liverpool

Research Experience

Trustworthy Autonomous Cyber-Physical Systems Laboratory (🏠 cgi.csc.liv.ac.uk/ acps) *University of Liverpool*
Research Intern *Apr 2022 - Feb 2023*
- Set up a basic autonomous driving development environment in the CARLA simulator with the CARLA-ROS bridge.
- Participated in AIcrowd Neural MMO Challenge (part of the IJCAI 2022 competition track).
- Participated in AIcrowd CityLearn Challenge (part of the NeurIPS 2022 competition track).
- Debugged the Jackal UGV navigation and object detection with backdoor attack demonstration for the Digital Innovation Facility opening day.
- Implemented four state-of-the-art deep reinforcement learning algorithms (DDPG, MADDPG, TD3, and SAC) in Python using Pytorch and tested in various Gymnasium's and PettingZoo's built-in environments.
- Large amount of deep reinforcement learning experiments were conducted through the utility of WandB, which gives insights into the reinforcement learning, optimal control, and deep learning.
- Built a containerised reinforcement learning experiment environment to support a doctoral student's research on applying spiking neural network to robotic tasks.

Summer Undergraduate Research Fellowship *XJTLU (remote)*
Control Quadrupedal Robots with OCS2 Toolbox *June - Oct 2022*
- ⌨ github.com/MinghongAlexXu/SURF-2022
- Containerised the ROS workspace with Docker for convenience of use.
- Studied optimal control algorithms but didn't quite understand them.
- Studied the official example of controlling ANYmal.
- Applied the toolbox to control Unitree Go1.

Work Experience

Shanghai Jiaqun Information Technology Co., Ltd *Shanghai, PR China*
Software Engineer Intern *June - Spet 2020, Feb - Mar 2021*
- Set up a NGINX web server used as a reverse proxy and load balancer.
- Set up a LNMP environment on CentOS in an Alibaba Cloud VPS and built a dynamic website using the WordPress framework.
- Wrote a microservice in Java using the Spring framework.
- Tested APIs using Postman.
- Set up a MQTT server in an Alibaba Cloud VPS.

Shanghai Jiaqun Information Technology Co., Ltd *Shanghai, PR China*
Software Engineer Intern *June - Spet 2019, Feb - Mar 2020*
- A cursory glance at Web development and technologies.
- Wrote a website in pure HTML.
- Analysed access logs of a shopping website in Python with Pandas.
- Analysed merchandise orders in Python with Pandas and Matplotlib.
- Implemented Web crawlers in Python using Scrapy and Beautiful Soup to systematically collect data for further analysis.

Projects

Mapless Navigation with Deep Reinforcement Learning *University of Liverpool*
Student-specified Final Year Project *June 2022 - Apr 2023*
- ⌨ github.com/MinghongAlexXu/final-year-proj
- Researched state-of-the-art deep reinforcement learning algorithms, current infrastructures, ecosystem, training techniques, and limitations.
- Implemented and packaged a deep reinforcement learning library in Python.
- Implemented a mapless navigation training environment in Gazebo Classic with ROS.

Simulating Postural Control on a Quadruped Robot in PyBullet *University of Liverpool*

Student-specified Year 2 Group Project *Jan 2022 - Apr 2022*

- github.com/MinghongAlexXu/year2-proj
- Managed four members.
- Identified and instigated the project.
- Researched postural control for quadruped robots.
- Programmed most part of the simulation program and maintained the code repository.
- Wrote the algorithm-related section of the report.

SLAM Map Building, Autonomous Navigation of a Known Map, and Object Detection *University of Liverpool*

Robotic Systems II Assignments *Jan 2023 - May 2023*

- github.com/MinghongAlexXu/ELEC330
- Deployed gmapping, navigation stack, and yolov5 on a self-invented robot in ROS1 and simulated in Gazebo Classic.
- Developed the same functionalities on JetBot but with ROS2 and tested in real indoor environments.

Achievements

| 2021 | **First Prize**, China RoboWork Competition | *XJTLU* |
| 2021 | **Successful Participant**, Mathematical Contest in Modelling | *XJTLU* |

Personal

Languages   English (professional proficiency), Mandarin Chinese (native proficiency), Japanese (limited proficiency)

References

Available upon request.