Dr. Xubo Lyu

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Academia and Industry Experience

PhD, Computing Science, Simon Fraser University, Canada. Sep. 2018 - Jan. 2024

- Researched efficient self-learning strategies for robot collision-free navigation, stabilization, and locomotion using machine learning and optimal control (Python, MATLAB, C++).
- Built simulations (ROS, Gazebo, Gym, Pybullet, DeepMind Control Suite) to model the sensors (Camera, LiDAR) and dynamics of robot systems like vehicles, drones, quadrupeds.
- Developed machine learning pipeline (PyTorch, Tensorflow, Openai-baselines, Garage) to train the neural-network controller and deploy it to real robot (turtlebot3, Crazyflie 2.1).

Associate Researcher, Huawei Technologies, Vancouver, Canada May. 2021 – Mar. 2022

- Researched efficient self-learning strategy for multi-robot cooperation in complex, long-term, multi-stage scenarios (e.g. room tour, warehouse) using hierarchical machine learning.
- Designed and simulated two multi-robot cooperative scenes (Ai2Thor) involving navigation and object interaction as test environment; performed machine learning training and evaluation (PyTorch).
- Published the research in a top conference venue and a Canadian Patent.

Algorithm Engineer, Horizon Robotics, Beijing, China Jul. 2016 – Apr. 2017

- Developed a software to automate image annotation for rapid ML dataset creation (C++, OpenCV).
- Built lane line detector and classifier from vehicle camera stream for self-driving (Python, Scikit-learn).

MSc, Control Science and Engineering, Beihang University, China. Sep. 2015 - Apr. 2018
BSc, Control Science and Engineering, Northeastern University, China. Sep. 2011 - Jun. 2015

- Developed a fingerprint recognition software from scratch (Python).
- Designed and built a 1:10 scale RC car for autonomous line-following (STM32 C, PID control).

Selected Publications

"Task-Oriented Koopman-Based Control with Contrastive Encoder". **Xubo Lyu**, Hanyang Hu, Seth Siriya, Ye Pu, Mo Chen. *7th Annual Conference on Robot Learning (CoRL)*. Atlanta, USA, 2023. **Recognized as the oral spotlight paper (6.6% acceptance rate).**

"Asynchronous, Option-Based Multi-Agent Policy Gradient: A Conditional Reasoning Approach". **Xubo Lyu**, Amin Banitalebi-Dehkordi, Mo Chen, Yong Zhang. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. Detroit, USA, 2023.

"TTR-Based Reward for Reinforcement Learning with Implicit Model Priors". **Xubo Lyu**, Mo Chen. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. Las Vegas, USA, 2020.

"System and Method of Cooperative Task Completion for Asynchronous Multi-Robot Applications". **Xubo Lyu**, Amin Banitalebi-Dehkordi, Mo Chen, Jiangcheng Zhu, Yong Zhang. **Canadian Patent**, No. WO2023240331A1.

Selected Awards

Simon Fraser University Graduate Fellowship ($6500 per Fall semester). Sep. 2018 - Sep. 2021
Helmut & Hugo Eppich Family Grad Schol Scholarship. Jan. 2020 and Jan. 2021
Beihang University First-class Graduate Scholarship. Sep. 2016