

Dr. Xubo Lyu

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Education

- PhD, Computing Science, Simon Fraser University, Canada. (GPA 4.07/4.3)** Sep. 2018 - Jan. 2024
- Focused on machine learning, artificial intelligence, and robotics.
- MSc, Control Science and Engineering, Beihang University, China.** Sep. 2015 - Apr. 2018
- BSc, Control Science and Engineering, Northeastern University, China.** Sep. 2011 - Jun. 2015

Technical Skills

- Reinforcement Learning, Supervised/Unsupervised Learning, Deep Neural Networks, GANs
- Programming Languages: Python, C/C++, MATLAB, JavaScript, Linux shell scripting
- Software Development: TensorFlow, PyTorch, OpenCV
- Tools: Docker, Git, Robot simulators (Gazebo, Gym), Unix/Linux, NumPy, Scikit-learn, Pandas

Work Experience

- Machine Learning Engineer, Huawei Technologies, Vancouver, Canada.** May. 2021 – Mar. 2022
- Designed and implemented a cloud-based ML algorithm using natural language command for efficient multi-robot control in complex tasks, especially when robots need to work asynchronously.
 - Developed a system for running multi-robot simulation scenarios, ML training and evaluation.
 - Published the project outcome in a top conference venue [2] and secure a Canadian Patent [4].
- Machine Learning Research Assistant, Simon Fraser University, Canada.** Sep. 2018 - Jan. 2024
- Developed novel machine learning algorithms combining policy gradient, contrastive learning, and control theory for robot navigation and locomotion, both in simulation and real world.
 - Led a team of 5-6 members in weekly discussions, code reviews, debugging, and documentation efforts.
 - Published papers in top conferences, demonstrating expertise in machine learning software development.
- Software Developer, Horizon Robotics, Beijing, China.** Jul. 2016 - Apr. 2017
- Developed GUI software to automate image annotation, resulting in 5x faster on ML dataset creation.
 - Built ML algorithms (e.g. SVM, random forest) for lane line detection from video stream for self-driving.

Personal Software Projects

FingerTap: a Fingerprint Recognition Software

- Implemented core machine vision algorithms from scratch using Python for fingerprint recognition, including image preprocessing, feature extraction, and pattern matching.
- Developed as my undergraduate capstone project, ranked among top 5% excellence.

IntroRL: Reinforcement Learning Algorithm Implementation

- Implemented classic RL algorithms based on Rich Sutton's book "Introduction to Reinforcement Learning", including Q-Learning, SARSA, and Temporal-Difference method.
- Developed in 2017 as early open-source materials for RL beginners. Gained 89 GitHub stars and 39 forks.

Selected Publications

- [1] "Task-Oriented Koopman-Based Control with Contrastive Encoder". CoRL 2023. (Oral spotlight paper)
- [2] "Asynchronous, Option-Based Multi-Agent Policy Gradient: A Conditional Reasoning Approach". IROS 2023.
- [3] "TTR-Based Reward for Reinforcement Learning with Implicit Model Priors". IROS 2020.
- [4] "System and Method of Cooperative Task Completion for Asynchronous Multi-Robot Applications". Canadian Patent, No. WO2023240331A1.