Chenning Yu

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 in Linkedin · \heartsuit GitHub

Research Interest

Deep Learning; Generative Agents; Robotics; Graph Neural Networks; Multi-Agent Planning

Education

University of California, San Diego • Ph.D. in Computer Science, Advisor: Prof. Sicun Gao

University of California, San Diego • M.S. in Computer Science Sept. 2021 - Jan. 2025 (Expected)

Sept. 2019 - Jun. 2021

Jun. 2022 - Oct. 2022

PUBLICATION

- [ICRA 24] Mingxin Yu, <u>Chenning Yu</u>, Mohammad Mahdi Naddaf Shargh, Devesh Upadhyay, Sicun Gao, Chuchu Fan. "Efficient Motion Planning for Manipulators with Barrier-Induced Neural Controller." *IEEE International Conference on Robotics and Automation*, 2024.
- [ICRA 23] Chenning Yu^{*}, Qingbiao Li^{*}, Sicun Gao, Amanda Prorok. "Accelerating Multi-Agent Planning Using Graph Transformers with Bounded Suboptimality." *IEEE International Conference on Robotics and* Automation, 2023.
- 5. [NeurIPS 23] Milan Ganai, Zheng Gong, Chenning Yu, Sylvia Herbert, Sicun Gao. "Iterative Reachability Estimation for Safe Reinforcement Learning." The Conference on Neural Information Processing Systems, 2023.
- 4. **[IROS 23]** Hongzhan Yu, Chiaki Hirayama, Chenning Yu, Sylvia Herbert, Sicun Gao. "Sequential Neural Barriers for Scalable Dynamic Obstacle Avoidance." *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2023. Best Robocup Paper Award.
- 3. [CoRL 22] Chenning Yu, Hongzhan Yu, Sicun Gao. "Learning Control Admissibility Models with Graph Neural Networks for Multi-Agent Navigation." The Conference on Robot Learning, 2022.
- 2. [NeurIPS 22] Ruipeng Zhang, Chenning Yu, Jingkai Chen, Chuchu Fan, Sicun Gao. "Learning-based Motion Planning in Dynamic Environments Using GNNs and Temporal Encoding." *The Conference on Neural Information Processing Systems*, 2022.
- 1. [NeurIPS 21] Chenning Yu, Sicun Gao. "Reducing Collision Checking for Sampling-Based Motion Planning Using Graph Neural Networks." The Conference on Neural Information Processing Systems, 2021.

ACADEMIC EXPERIENCE

Research Intern @ Reliable Autonomous Systems Lab, MIT

Designing Generalizable Reinforcement Learning Agents with Highly Safe Performances Advisor: Prof. Chuchu Fan

- Designed a set-theoretic formulation of RL policies to guarantee the forward invariance for safety-critical constraints.
- Generalized the RL agents to out-of-distribution tasks using the compositionality, and attaining highly safe performances.
- Tested the approach in a safety-critical MuJoCo robot environment with a performance of over 90% per-state safeness.

Research Intern @ Prorok Lab, University of Cambridge (Remote)Jun. 2022 - Sept. 2022Accelerating Multi-Agent Planning using Graph Transformers and Contrastive LearningAdvisor: Prof. Amanda Prorok

• Incorporated the Graph Transformers into a provably near-optimal planning framework for computation acceleration.

- Analyzed the approach in continuous clustered environments up to 30 agents, which are infeasible for traditional planners.
- \circ Increased the success rates of the multi-agent planners by over 25% on average, with near-optimal performances.

TECHNICAL SKILLS

ProgrammingPython, Bash, MATLABDevelopment & ToolsPyTorch, Distributed Data Parallel, Hydra, JAX, Numpy, Scipy, Linux, Git, Jupyter Notebook

PROFESSIONAL ACTIVITIES

Conference Reviewer AAAI 2023, ICLR 2024, ICML 2024, ICRA 2023/2024, L4DC 2023, NeurIPS 2023