

Letian Chen

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EDUCATION

Georgia Institute of Technology, Atlanta GA

Expected May 2025

Doctor of Philosophy in Computer Science, School of Interactive Computing. GPA: 4.00/4.00

Georgia Institute of Technology, Atlanta GA

May 2020

Master of Science in Computer Science, College of Computing. GPA: 4.00/4.00

- Concentration: Machine Learning
- Thesis: “Robot Learning from Heterogeneous Demonstration”

Peking University, Beijing China

July 2018

Bachelor of Science in Psychology, School of Psychological and Cognitive Sciences. GPA: 3.78/4.00

Bachelor of Science in Computer Science, School of Electronics Engineering and Computer Science. GPA: 3.80/4.00

AWARDS & HONORS

- Best paper finalist in Conference on Robot Learning (CoRL 2020) Nov 2020
- First place in Brainhack ATL 2019 Track 2 Nov 2019
- Graduate of merit in Beijing Jul 2018
- Excellent Graduate in Peking University Jul 2018
- Zhang Wenjin Scholarship Dec 2017
- Scholarship for undergraduate research Sep 2017

RESEARCH EXPERIENCE

Fast Lifelong Personalized Learning from Crowdsourced Demonstration

2021

Graduate Research Assistant, Advisor: Matthew Gombolay, Georgia Institute of Technology

- Analyzed the personalization problem in lifelong learning from demonstration process where large number of heterogeneous demonstrations arrive sequentially by federation between users
- Proposed a novel IRL framework, FLAIR, to provide efficient personalization and scalability by constructing *policy mixtures* with a concise set of prototypical strategy policies
- Applied FLAIR on three virtual robotic control tasks and a real robot table-tennis task; achieved better personalization with significantly higher sample efficiency

Learning from Suboptimal Demonstration

2020

Graduate Research Assistant, Advisor: Matthew Gombolay, Georgia Institute of Technology

- Characterized policy performance degradation from noise injection by a sigmoid function
- Proposed a novel IRL framework, SSRR, to learn policies that are better than suboptimal demonstrations by inferring the idealized reward function (i.e., the latent intent of the demonstrator)
- Applied algorithm on three virtual robotic tasks and a real robot table-tennis task; achieved accurate recovery of the demonstrator intention and a better-than-best-demonstration policy

Joint Inference of Task Reward and Strategy Reward

2019

Graduate Research Assistant, Advisor: Matthew Gombolay, Georgia Institute of Technology

- Modeled humans' latent objective via shared task reward and individual strategy reward
- Proposed a novel IRL framework, MSRD, to jointly infer task reward and strategy reward to gain a better estimation of both
- Applied algorithm on two virtual robot control tasks and one real robot table-tennis task; achieved better learning of task reward than SOTA AIRL, extracted precise strategic rewards, and optimized versatile policies that resemble the heterogeneous demonstrations

TEACHING & LEADERSHIP EXPERIENCE

Advising & Mentorship

- Sravan Jayanthi, B.Sc. Student at Georgia Tech, now M.Sc. Student at Georgia Tech
- Van Duong, M.Sc. Student at Georgia Tech, now at Jet Propulsion Laboratory

Teaching Assistantship

- *Interactive Robot Learning* (CS 7648) - Graduate Section, School of Interactive Computing, Georgia Institute of Technology (Spring 2021) | Supervisor: Prof. Matthew Gombolay
- *Machine Learning* (OMSCS 7641) - Graduate Section, School of Computer Science, Georgia Institute of Technology (Fall 2020, Spring 2019) | Supervisor: Prof. Charles Isbell
- *Introduction to Computation* - Undergraduate Section, School of Electronics Engineering and Computer Science, Peking University (Fall 2016) | Supervisor: Prof. Jun Sun

Minister of Academic Department

Students' Union, School of Psychological and Cognitive Sciences, Peking University (Sep 2015 – July 2016)

- Planned academic seminars, culture events, and senior experience sharing seminars

INDUSTRY EXPERIENCE

iRobot Corporation, Reinforcement Learning Intern

May 2021 – Aug 2021

- Identified real-world challenges of Offline Policy Evaluation (OPE) methods
- Created a ease-to-use benchmark dataset where real-world challenges present
- Proposed an ad-hoc OPE algorithm selection method via validation mechanisms

ACADEMIC SERVICE

Technical Manuscript Reviewer for

- IEEE Robotics and Automation Letters
- International Conference on Intelligent Robots and Systems 2022
- International Conference on Robotics and Automation 2022
- International Conference on Autonomous Agents and Multiagent Systems 2022
- AAAI Fall Symposium Series on AI for HRI 2022
- Robotics: Science and Systems 2021
- International Conference on Machine Learning 2021

PUBLICATIONS

- [1] **L. Chen***, S. Jayanthi*, and M. Gombolay, "Strategy discovery and mixture in lifelong learning from heterogeneous demonstration," in *Proceedings of AAAI Interactive Machine Learning workshop*, 2022
- [2] E. Seraj, **L. Chen**, and M. C. Gombolay, "A hierarchical coordination framework for joint perception-action tasks in composite robot teams," *IEEE Transactions on Robotics*, 2021
- [3] **L. Chen**, R. Paleja, and M. Gombolay, "Towards sample-efficient apprenticeship learning from suboptimal demonstration," in *Artificial Intelligence for Human-Robot Interaction (AI-HRI), AAAI Fall Symposium Series*, 2021
- [4] D. Dias, M. Zenati, R. Srey, D. Arney, **L. Chen**, R. Paleja, L. Kennedy-Metz, and M. Gombolay, "Using machine learning to predict perfusionists' critical decision-making during cardiac surgery," in *Augmented Environments for Computer Assisted Interventions (AE-CAI), Computer Assisted and Robotic Endoscopy (CARE), and Context-Aware Operating Theaters (OR 2.0) Joint MICCAI workshop*, 2021
- [5] R. Paleja, A. Silva, **L. Chen**, and M. Gombolay, "Interpretable and personalized apprenticeship scheduling: Learning interpretable scheduling policies from heterogeneous user demonstrations," in *AAMAS Autonomous Robots and Multirobot Systems (ARMS) Workshop*, 2021
- [6] **[Best Paper Finalist][Plenary Talk] L. Chen**, R. Paleja, and M. Gombolay, "Learning from suboptimal demonstration via self-supervised reward regression," in *Proceedings of Conference on Robot Learning (CoRL)*, 2020

- [7] **L. Chen**, “Robot learning from heterogeneous demonstration,” *Master Thesis*, 2020
- [8] R. Paleja, A. Silva, **L. Chen**, and G. Matthew, “Interpretable and personalized apprenticeship scheduling: Learning interpretable scheduling policies from heterogeneous user demonstrations,” in *Proceedings of Advances in Neural Information Processing Systems (NeurIPS)*, 2020
- [9] **L. Chen**, R. Paleja, M. Ghuy, and M. Gombolay, “Joint goal and strategy inference across heterogeneous demonstrators via reward network distillation,” in *Proceedings of International Conference on Human-Robot Interaction (HRI)*, 2020
- [10] **L. Chen**, “Model-free vs model-based algorithms in human sequential decision making,” *Undergraduate Thesis*, 2018
- [11] Y. Fan, **L. Chen**, and Y. Wang, “Efficient model-free reinforcement learning using gaussian process,” *arXiv preprint arXiv:1812.04359*, 2018