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 among 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