Letian Chen

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Education

Georgia Institute of Technology **Expected May 2025**
Doctor of Philosophy in Computer Science, College of Computing Atlanta, GA
- **GPA: 4.00/4.00**

Georgia Institute of Technology **May 2020**
Master of Science in Computer Science, College of Computing Atlanta, GA
- **GPA: 4.00/4.00**
- Concentration: Machine Learning

Peking University **July 2018**
Bachelor of Science in Psychology, School of Psychological and Cognitive Sciences Beijing, China
Bachelor of Science in Computer Science, School of Electronics Engineering and Computer Science
- **Overall GPA: 3.70/4.00**
- **Psychology Major GPA: 3.78/4.00**
- **Computer Science Major GPA: 3.80/4.00**

Publications

- **[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
- L. Chen, "Robot learning from heterogeneous demonstration," *Master Thesis*, 2020
- 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
- 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
- L. Chen, "Model-free vs model-based algorithms in human sequential decision making," *Undergraduate Thesis*, 2018
- Y. Fan, L. Chen, and Y. Wang, "Efficient model-free reinforcement learning using gaussian process," *arXiv preprint arXiv:1812.04359*, 2018

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 (5%) **Jul 2018**
- Excellent Graduate in Peking University **Jul 2018**
- Zhang Wenjin Scholarship (1%) **Dec 2017**
- Scholarship for undergraduate research **Sep 2017**
- First Prize of National Olympiad in Informatics in Provinces Advanced Group **Nov 2012**

Research Experience

Learning from Suboptimal Demonstration **DEC 2019 – AUG 2020**
Graduate Research Assistant, Advisor: Matthew Gombolay, Georgia Institute of Technology

- Characterized policy performance degradation from noise injection
- Proposed a novel IRL framework, SSRR, that accurately learn the latent reward function from suboptimal demonstration
- Proposed Noisy-AIRL to enhance the robustness of SSRR by providing more reliable initial reward
- Applied algorithm on three virtual robot control tasks (HalfCheetah, Hopper, Ant) and one real robot table-tennis task; achieved more accurate learning of reward and better-than-best-demonstration policy

Joint Inference of Task Reward and Strategy Reward **Aug – Dec 2019**

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

- Modeled the reward functions that humans optimized as a linear combination of task reward (shared by all strategies) and strategy reward (specific to each strategy)
- Proposed a novel IRL framework where task rewards and strategic rewards are jointly inferred to gain a better estimation of the task reward and decomposition of strategy reward components
- Applied algorithm on two virtual robot control tasks (Inverted Pendulum and Hopper) and one real robot table-tennis task; achieved better learning of task reward than SOTA AIRL and successfully extracted strategic rewards

Model-Free and Model-Based Learning in Human Decision Making **Sep 2017 – May 2018**

Undergraduate Thesis, Advisor: Hang Zhang, Peking University

- Designed an experiment to investigate human's learning strategy (model-free vs model-based) under multi-task RL setting
- Showed hybrid model with forgetting mechanism best explained subject data via computational model comparison
- Illustrated the conclusion by simulation showing learned hybrid model recovered subject behaviors
- Exploring meta-learning computational model explanations

Better Exploration utilizing Good and Bad Demos **Sep 2016 – Jan 2018**

Team Leader, Undergraduate Research, Advisor: Yizhou Wang, Peking University

- Introduced a new LfD algorithm built on Posterior Sampling treating variety-quality demonstration data as exploration seeds
- Proposed sample efficiency proof for the new approach based on Gaussian Process and Posterior Sampling
- Developed a tool to record human demonstrations on OpenAI Universe platform

Projects

Self-Supervised Action Mining for Fish Behavior, *Georgia Institute of Technology* **Sep 2019 – Dec 2019**

- Designed pretext tasks to self-supervised learn features that capture fish behaviors
- Clustered learned features to discover meaningful fish behaviors
- Finetuned on downstream classification tasks and achieved better performance than Resnet-3D trained from scratch

Reconnaissance Blind Multi-Chess, *Georgia Institute of Technology* **Jan 2019 – May 2019**

- Applied maximum information gain principle for reconnaissance and maintained belief space for possible board states
- Learned neural network policy to choose action based on belief states‘

Doodle Recognition, *Georgia Institute of Technology* **Sep 2018 – Dec 2018**

- Explored NN architectures (ShuffleNet, MobileNet, 3D-CNN, LSTM, etc.) to tackle Doodle Recognition task
- Results are shown on Github

Face Morphing, *Peking University* **Mar 2016 – May 2016**

- Implemented face morphing algorithm in C++ via face landmark detection and Delaunay triangulation
- Codebase and Results are shown on Github

Chinese Word Segmentation, *Peking University* **Feb 2016 – May 2016**

- Developed crawler to automatically scrape Chinese news articles
- Calculated condensation degree and freedom degree for each word, applied *n*-gram to divide sentence into words
- Improved accuracy by introducing work frequency to assist segmentation

Leadership Experience

Minister of Academic Department, *Students' Union, School of Psychological and Cognitive Sciences, Peking University* **Sep 2015 – July 2016**

- Scheduled academic events (e.g., academic seminars, psychology culture events, senior experience sharing seminars, etc.)
- Liaised with students and departments regarding academic affair

Work Experience

iRobot Corporation, *Reinforcement Learning Intern* **May 2021 – Aug 2021**

- Research about Offline Policy Evaluation (OPE)

Georgia Institute of Technology, *Teaching Assistant* **Jan 2021 – May 2021**

- Assisted CS 7648 *Interactive Robot Learning*
- Graded homework and exam papers
- Held office hours
- Moderated course interactions

Georgia Institute of Technology, *Teaching Assistant* **Aug 2020 – Dec 2020**

- Assisted OMSCS 7641 *Machine Learning*
- Graded homework and exam papers

Georgia Institute of Technology, *Research Assistant* **May 2019 – May 2020**

- Assisted Professor Matthew Gombolay
- Worked on multi-agent expected policy gradient and sampling-based policy gradient
- Worked on heterogeneous inverse reinforcement learning and robot table tennis
- Worked on learning from suboptimal demonstration

Georgia Institute of Technology, *Teaching Assistant* **Jan 2019 – May 2019**

- Assisted OMSCS 7641 *Machine Learning*
- Graded homework and exam papers

Peking University, *Teaching Assistant* **Sep 2016 – Jan 2017**

- Assisted Professor Jun Sun in *Introduction to Computation*
- Designed practice sets, held office hour, set exam papers

Peking University, PKU Helper Team, *Senior iOS Developer* **Sep 2015 – Aug 2018**

- Developed and maintained iOS app "PKU Helper" for Peking University campus life (10k+ users)

Skills

Python, Tensorflow, C/C++, Matlab, Java, Bash, SQL, JavaScript, HTML, CSS, Scheme, Swift, R