Jason Xinyu Liu

jasonxyliu.github.io
xinyu_liu@brown.edu

Education

2018 – 2023 **Ph.D. in Computer Science**, *Brown University*, Providence, RI

Advisor: Stefanie Tellex
Research: Reinforcement Learning, Robotics, Natural Language Processing, Computer Vision

2021 **M.S. in Computer Science**, *Brown University*, Providence, RI

Advisor: Stefanie Tellex

2017 **B.S. in Electrical Engineering and Computer Sciences**, *University of California, Berkeley*, Berkeley, CA

Advisor: Ken Goldberg, David Wagner
Research: Robotic Grasping, Usable Security

Publications

ICRA 2022 **Leveraging Temporal Structure in Task Specifications for POMDP Planning**
X. Liu, E. Rosen, S. Zheng, T. Edward, A. Shah, G. D. Konidaris, S. Tellex
Under Review. *IEEE International Conference on Robotics and Automation 2022*. [PDF, video]

ICRA 2022 **Generalizing to New Domains by Mapping Natural Language to Lifted LTL**
E. Hsiung, H. Mehta, J. Chu, X. Liu, R. Patel, S. Tellex, G. D. Konidaris
Under Review. *IEEE International Conference on Robotics and Automation 2022*. [PDF]

RSS-W 2021 **Leveraging Temporal Structure in Safety-Critical Task Specifications for POMDP Planning**
X. Liu, E. Rosen, S. Zheng, G. D. Konidaris, S. Tellex
Robotics: Science and Systems Workshop Robotics for People 2021. [PDF, poster]

RSS-W 2021 **Dialogue Object Search**
M. Roy*, K. Zheng*, X. Liu, S. Tellex
Robotics: Science and Systems Workshop Robotics for People 2021. [PDF]

2019 **Specificity-Controlled Video Captioning**
X. Liu, E. Pavlick, D. Ritchie, G. D. Konidaris, S. Tellex
Technical Report 2019. [PDF]

ICRA 2018 **Dex-Net 3.0: Computing Robust Vacuum Suction Grasp Targets in Point Clouds Using a New Analytic Model and Deep Learning**
J. Mahler, M. Matl, X. Liu, A. Li, D. Gealy, K. Goldberg
IEEE International Conference on Robotics and Automation 2018. [PDF]

ICISS 2018 **Detecting Phone Theft Using Machine Learning**
X. Liu, S. Egelman, D. Wagner
International Conference on Information Science and System 2018. [PDF]

RSS 2017 **Dex-Net 2.0: Deep Learning to Plan Robust Grasps with Synthetic Point Clouds and Analytic Grasp Metrics**
J. Mahler, J. Liang, S. Niyaz, M. Laskey, R. Doan, X. Liu, J. A. Ojea, K. Goldberg
Robotics: Science and Systems 2017. [PDF]

Research Projects

2020-2021 **POMDP Planning with Temporally-Extended Task Specifications**
- Developed a novel POMDP planner that leverages structure in temporally-extended task specifications
- Tested in simulation and showed up to 50% improvement in wall clock time
- Deployed the end-to-end system on a mobile manipulator robot

2019 **Specificity-Controlled Video Captioning**
- Developed a deep learning model to generate captions of input videos, conditioned on a specificity control variable
- Designed and implemented a metric to measure specificity of natural language captions
- Designed and implemented an automatic evaluation tool specifically for specificity-controlled video captioning tasks

2019 **VR Kitchen**
- Developed a kitchen scene with manipulatable objects in Unity
- Conducted a user study to collect video, audio and trajectory data of participates performing household tasks in VR
- Analyzed the collected dataset for movement and speech patterns

2017-2018 **Vision-based Robotic Grasping**
- Programmed an Arduino microcontroller for suction control
- Implemented baseline analytic metrics to measure grasp success

2016-2017 **Machine Learning for Mobile Security**
- Applied machine learning algorithms to automatically detect smartphone theft
- Conducted a user study to collect smartphone sensor data for training

Professional Experience

Summer 2015 **Software Engineer**, *NetSuite*, San Mateo, CA
- Migrated a web-based database query tool from SQL to Elasticsearch
- Implemented backend in Java and frontend in JavaScript

Skills

Computing Python, Java, C++, MATLAB,
PyTorch, TensorFlow,
Linux, ROS, Unity, Slurm, Arduino, LaTeX

Language English, Chinese

Relevant Coursework

Brown University Learning and Sequential Decision Making
Reintegrating AI
Probabilistic Methods in Computer Science
Probability for Computing and Data Analysis
Computational Linguistics
Computational Semantics
Computer Vision for Graphics and Interaction

UC Berkeley Introduction to Artificial Intelligence
Introduction to Machine Learning
Algorithmic Human-Robot Interaction
Linear Algebra
Optimization Models in Engineering

Awards and Honors

Brown University **National Science Foundation Graduate Research Fellowship Program**, 2018
Jack Kent Cooke Foundation Graduate Scholarship, 2018

UC Berkeley **Tau Beta Pi, National Engineering Honor Society**, Fall 2014
Eta Kappa Nu, National EECS Honor Society, Fall 2014
Term Honor: Honors to Date, Fall 2014, Spring 2015
Jack Kent Cooke Foundation Undergraduate Transfer Scholarship, 2014

Service

Review **ICRA**, 2022

Brown CS **First-year PhD mentor**, 2020-present
Google exploreCSR (explorecsr.cs.brown.edu), 2020-2021