

Jason Xinyu Liu

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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]
- 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]
- 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 to leverage 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 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 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 participants 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 an internal 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, L^AT_EX.
- 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

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