

WEIYU LIU

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RESEARCH INTEREST

My research aims to develop autonomous robots that can effectively perceive, model, and interact with objects in the real world by integrating semantic knowledge with sensorimotor data.

EDUCATION

Georgia Institute of Technology, Atlanta, GA 2017 – Present
Ph.D. in Robotics
Advisor: Sonia Chernova

Georgia Institute of Technology, Atlanta, GA 2012 – 2017
Bachelor of Science, Electrical Engineering with Distinction, Minor in Computer Science

RESEARCH EXPERIENCE

NVIDIA Research, Seattle, WA, Summer 2021
Robotics Research Intern with Dieter Fox, Tucker Hermans, and Chris Paxton

Georgia Institute of Technology, Atlanta, GA 2017 – Present
Graduate Research Assistant with Sonia Chernova

Georgia Institute of Technology, Atlanta, GA 2016 – 2017
Undergraduate research with Sonia Chernova

Georgia Institute of Technology, Atlanta, GA 2014 – 2016
Undergraduate research with Fumin Zhang

PUBLICATIONS

Preprints

- A Survey of Semantic Reasoning Frameworks for Robotic Systems
Weiyu Liu*, Angel Daruna*, and Sonia Chernova.
Under review, Robotics and Autonomous Systems (RAS), 2020
- Leveraging Semantics for Incremental Learning in Multi-Relational Embeddings
Angel Daruna, **Weiyu Liu**, Zsolt Kira, and Sonia Chernova.
arXiv, 2019

Conference and Journal Papers

- StructFormer: Learning Spatial Structure for Language-Guided Semantic Rearrangement of Novel Objects
Weiyu Liu, Chris Paxton, Tucker Hermans, and Dieter Fox.
International Conference on Robotics and Automation (ICRA), 2022

- Learning Instance-Level N-Ary Semantic Knowledge At Scale For Robots Operating in Everyday Environments
Weiyu Liu, Dhruva Bansal, Angel Daruna, and Sonia Chernova.
Robotics: Science and Systems (RSS), 2021
- Towards Robust One-shot Task Execution using Knowledge Graph Embeddings
Angel Daruna, Lakshmi Nair, **Weiyu Liu**, and Sonia Chernova.
International Conference on Robotics and Automation (ICRA), 2021
- An Affordance Keypoint Detection Network for Robot Manipulation
Ruian Xu, Fu-Jen Chu, Chao Tang, **Weiyu Liu**, and Patricio Vela.
Robotics and Automation Letters (ICRA), 2021
- Same Object, Different Grasps: Data and Semantic Knowledge for Task-Oriented Grasping
Adithya Murali, **Weiyu Liu**, Kenneth Marino, Sonia Chernova, and Abhinav Gupta.
Conference on Robot Learning (CoRL), 2020
- CAGE: Context-Aware Grasping Engine
Weiyu Liu, Angel Daruna, and Sonia Chernova.
International Conference on Robotics and Automation (ICRA), 2020.
- Path Ranking with Attention to Type Hierarchies
Weiyu Liu, Angel Daruna, Zolt Kira, and Sonia Chernova.
Conference on Artificial Intelligence (AAAI), 2020.
- Taking Recoveries to Task: Recovery-Driven Development for Recipe-based Robot Tasks
Siddhartha Banerjee*, Angel Daruna*, David Kent*, **Weiyu Liu***, Jonathan Balloch, Abhinav Jain, Akshay Krishnan, Muhammad Asif Rana, Harish Ravichandar, Binit Shah, Nithin Shrivatsav, and Sonia Chernova.
International Symposium on Robotics Research (ISRR), 2019.
- Autonomous flying blimp interaction with human in an indoor space
Ningshi Yao, Qiuyang Tao, **Weiyu Liu**, Zhen Liu, Ye Tian, Peiyu Wang, Timothy Li, and Fumin Zhang.
Frontiers of Information Technology & Electronic Engineering, 20, 2019.
- RoboCSE: Robot Common Sense Embedding
Angel Daruna, **Weiyu Liu**, Zolt Kira, and Sonia Chernova.
International Conference on Robotics and Automation (ICRA), 2018.
- SiRoK: Situated Robot Knowledge - Understanding the Balance Between Situated Knowledge and Variability
Sonia Chernova, Vivian Chu, Angel Daruna, Haley Garrison, Meera Hahn, Priyanka Khante, **Weiyu Liu**, and Andrea Thomaz.
AAAI Spring Symposium Series (AAAI-SSS), 2018.
- Situated Bayesian Reasoning Framework for Robots Operating in Diverse Everyday Environments
Sonia Chernova, Vivian Chu, Angel Daruna, Haley Garrison, Meera Hahn, Priyanka Khante, **Weiyu Liu**, and Andrea Thomaz.
International Symposium on Robotics Research (ISRR), 2017.

TEACHING

Georgia Institute of Technology, Atlanta, GA
Graduate Teaching Assistant for Sonia Chernova and Sean Wilson
CS 7785 Intro Robotics Research

Fall 2021

Georgia Institute of Technology, Atlanta, GA
Graduate Teaching Assistant for Sonia Chernova

Spring 2018

CS 3630 Introduction to Robotics and Perception

Georgia Institute of Technology, Atlanta, GA

Fall 2014

Peer Tutor

Learning Assistance Program, Best Tutor Award

LEADERSHIP and PROFESSIONAL SERVICE

Georgia Institute of Technology, *Vice President Academic, RoboGrads*

2019 – 2020

Reviewer for ICRA

2019 – 2022

Reviewer for RA-L

2020 – 2022

Reviewer for RSS

2021

Reviewer for CoRL

2021

Reviewer for IROS

2022

AWARDS and HONORS

Fetch it! The Mobile Manipulation Challenge, *First Place*

2019

Georgia Institute of Technology, *Dean's List*

2012 – 2017

TALKS

Grounded Semantic Reasoning for Interacting with Real-World Objects, Univ. of Toronto

2022

Grounded Semantic Reasoning for Interacting with Real-World Objects, Univ. of Michigan

2022

Beyond the Label: Robots that Reason about Object Semantics, NeurIPS Robot Learning Workshop

2021

Combining Multimodal Interactive Perception and Semantic Reasoning, ICRA Semantic Representations Workshop

2021

Learning Instance-Level N-Ary Semantic Knowledge, ICRA

2020

CAGE: Context-Aware Grasping Engine, ICRA

2020

Path Ranking with Attention to Type Hierarchies, AAAI

2020

Taking Recoveries to Task, ISRR

2019

MENTORSHIP

Chao Tang, ECE M.S. → Robotics Ph.D. at SUSTech, China

2022 – Present

Dhruva Bansal, CS B.S. → CS M.S. at Stanford

2021

Jayanta Bhowmick, CS M.S. → Amazon

2021

Sushrut Kulkarni, CS M.S.

2021