

Shuijing Liu

Postdoctoral Scholar

Computer Science

The University of Texas at Austin

Research interests

I'm excited about enabling robots to operate in unstructured human environments, such as our homes and offices. I consider human modeling, interaction reasoning, and decision making as essential capabilities of such robots. Thus, my research is at the intersection of **robot learning** and **human-robot interaction**. I use AI tools to develop fundamental learning paradigms for human-centered robotics problems. My research is inspired by and deployed in challenging real-world applications, including navigation in human crowds, autonomous driving, instruction following, and assistive robots for people with disabilities.

Contact

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Website: <https://shuijing725.github.io>

Google Scholar: <https://scholar.google.com/citations?user=I4k7ukgAAAAJ>

Education

University of Illinois at Urbana-Champaign

2018 – 2024

Ph.D. in Electrical and Computer Engineering

Advisor: Prof. Katherine Driggs-Campbell

Thesis: [Learning Structured Interaction Models for Robot Navigation in Human Environments](#)

University of Illinois at Urbana-Champaign

2014 – 2018

B.S. in Computer Engineering, minor in Art and Design (**Graduated with Highest Honor**)

Undergraduate Thesis: Prostate Cancer Diagnosis with Deep Learning

Appointments

The University of Texas at Austin

08/15/2024 – current

Postdoctoral scholar with Yuke Zhu

Publications

*, † indicate equal contributions

- Learning Coordinated Bimanual Manipulation Policies using State Diffusion and Inverse Dynamics Models**
H. Chen, J. Xu*, L. Sheng*, T. Ji, **S. Liu**, Y. Li, and K. Driggs-Campbell.
In International Conference on Robotics and Automation (ICRA), 2025.
- DRAGON: A Dialogue-Based Robot for Assistive Navigation with Visual Language Grounding**
S. Liu, A. Hasan, K. Hong, R. Wang, P. Chang, Z. Mizrahi, J. Lin, D. L. McPherson, W. A. Rogers, and K. Driggs-Campbell.
In Robotics and Automation Letters (RA-L), 2024.
- Predicting Object Interactions with Behavior Primitives: An Application in Stowing Tasks**
H. Chen, Y. Niu, K. Hong, **S. Liu**, Y. Wang, Y. Li, and K. Driggs-Campbell.
In Conference on Robot Learning (CoRL), 2023.

(Best Paper/Student Paper Award Finalist)

4. **A Data-Efficient Visual-Audio Representation with Intuitive Fine-tuning for Voice-Controlled Robots**
P. Chang, **S. Liu**, T. Ji, N. Chakraborty, K. Hong, and K. Driggs-Campbell.
In Conference on Robot Learning (CoRL), 2023.
5. **Structural Attention-Based Recurrent Variational Autoencoder for Highway Vehicle Anomaly Detection**
N. Chakraborty, A. Hasan*, **S. Liu***, T. Ji*, W. Liang, D. L. McPherson, and K. Driggs-Campbell.
In International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2023.
6. **Intention Aware Robot Crowd Navigation with Attention-Based Interaction Graph**
S. Liu, P. Chang, Z. Huang, N. Chakraborty, W. Liang, J. Geng, and K. Driggs-Campbell.
In IEEE International Conference on Robotics and Automation (ICRA), 2023.
(Best poster award at the IROS 2023 Last-Mile Robotics Workshop)
7. **Occlusion-Aware Crowd Navigation Using People as Sensors**
Y. J. Mun, M. Itkina, **S. Liu**, and K. Driggs-Campbell.
In IEEE International Conference on Robotics and Automation (ICRA), 2023.
8. **Learning Visual-Audio Representations for Voice-Controlled Robots**
P. Chang, **S. Liu**, and K. Driggs-Campbell.
In IEEE International Conference on Robotics and Automation (ICRA), 2023.
9. **Learning to Navigate Intersections with Unsupervised Driver Trait Inference**
S. Liu, P. Chang, H. Chen, N. Chakraborty, and K. Driggs-Campbell.
In International Conference on Robotics and Automation (ICRA), 2022.
10. **Off Environment Evaluation Using Convex Risk Minimization**
P. Katdare, **S. Liu**, and K. Driggs-Campbell.
In International Conference on Robotics and Automation (ICRA), 2022.
11. **Combining Model-Based Controllers and Generative Adversarial Imitation Learning for Traffic Simulation**
H. Chen, T. Ji, **S. Liu**, and K. Driggs-Campbell.
In IEEE International Conference on Intelligent Transportation Systems (ITSC), 2022.
12. **An Interdisciplinary Approach: Potential for Robotic Support to Address Wayfinding Barriers Among Persons with Visual Impairments**
M. A. Bayles, T. Kadylak, **S. Liu**, A. Hasan, W. Liang, K. Hong, K. Driggs-Campbell, and W. A. Rogers
In Human Factors and Ergonomics Society Annual Meeting (HFES), 2022.
13. **Decentralized Structural-RNN for Robot Crowd Navigation with Deep Reinforcement Learning**
S. Liu*, P. Chang*, W. Liang†, N. Chakraborty†, and K. Driggs-Campbell.
In IEEE International Conference on Robotics and Automation (ICRA), 2021.
14. **Robot Sound Interpretation: Combining Sight and Sound in Learning-based Control**
P Chang, **S Liu**, H Chen, and K Driggs-Campbell.
In IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.
15. **Robust Deep Reinforcement Learning with Adversarial Attacks**
A. Pattanaik, Z. Tang*, **S. Liu***, G. Bommanna, and G. Chowdhary.
In International Conference on Autonomous Agents and Multiagent Systems (Extended Abstract), 2018.

Preprints

1. **Open-World Assistive Teleoperation of Mobile Manipulators with Vision Language Models**
H. Liu, R. Shah, **S. Liu**, Y. Cui, Y. Bisk, R. Martín-Martín, and Y. Zhu.
Under review, 2025.
2. **SocialNav-SUB: Benchmarking VLMs for Scene Understanding in Social Robot Navigation**
M. J. Munje, C. Tang, **S. Liu**, Z. Hu, Y. Zhu, J. Cui, G. Warnell, J. Biswas, and P. Stone.
Under review, 2025.

3. **HEIGHT: Heterogeneous Interaction Graph Transformer for Robot Navigation in Crowded and Constrained Environments**
S. Liu, H. Xia, F. Cheraghi Pouria, K. Hong, N. Chakraborty, and K. Driggs-Campbell.
Under review, 2024.
4. **Sim-to-Real Adaptation with Graph-Based Neural Dynamics for Granular Object Manipulation**
K. Hong, H. Chen*, R. Wang*, K. Wang*, M. Zhang, S. Liu, Y. Li, and K. Driggs-Campbell.
In preparation, 2025.
5. **ComposableNav: Composable Instruction-Following Navigation in Dynamic Environments via Diffusion**
Z. Hu, C. Tang, A. Liu, Y. Zhu, M. J. Munje, S. Liu, Y. Li, G. Warnell, P. Stone, and J. Biswas.
In preparation, 2025.

Honors and Awards

- [Rising Stars in EECS](#) 2024
- [Best Student Paper Award Finalist at CoRL 2023](#) 2023
- [Best poster award at the IROS 2023 Last-Mile Robotics Workshop](#) 2023
- Conference Travel Award, ECE department at UIUC 2022
- Honorable mention for TechSAGE Stretch Robot Pitch Competition 2021
- Lauren Kelley Memorial Scholarship 2017 – 2018
- Professor N. Narayana Rao Scholarship 2016
- Oakley Scholarship 2015
- Dean's List, ECE department at UIUC 2014 – 2016

Invited Talks

- **Learning Structured Interaction Models for Robot Navigation in Human Environments**
[RobotiXX Lab](#), George Mason University, 2024.
[Stanford Intelligent Systems Laboratory \(SISL\)](#), 2024.
[Learning Agents Research Group \(LARG\)](#), UT Austin, 2024.
- **Robot Learning to Interact in Human Spaces**
[UT Austin Robot Perception and Learning Lab](#), 2024.
[Stanford Vision and Learning Lab \(SVL\)](#), 2024.
- **A Dialogue-Based Robot for Assistive Navigation with Visual Language Grounding**
[CSL Student Conference](#), 2024.
- **Intelligent Robot Crowd Navigation**
[Shuzihuanyu Lecture Series](#), 2023.
- **Pedestrian Trajectory Prediction Meets Social Robot Navigation**
[Robotics Seminar at Illinois](#), 2022.
- **Robot Learning Through Interactions with Humans**
[Robotics Seminar at Illinois](#), 2021.

Academic Service

Program committee

- Co-organizer of [ICLR 2025 Workshop on Human-AI Coevolution](#)

Students mentored

- [Huihan Liu](#), Ph.D. student in UT Austin.
- [Zichao Hu](#), Ph.D. student in UT Austin.
- [Michael Munje](#), Ph.D. student in UT Austin.
- [Michael \(Pengen\) Zhang](#), B.S. Computer Science 2026 in UT Austin.

- [Changyeon Kim](#): Ph.D. student in KAIST, visiting scholar in UT Austin.
- [Haonan Chen](#): Ph.D. student in UIUC.
- [Kaiwen Hong](#): Ph.D. student in UIUC.
- [Neeloy Chakraborty](#): B.S. Computer Engineering 2021, now Ph.D. student in UIUC.
- [Eric \(Weihang\) Liang](#): M.S. Electrical and Computer Engineering in UIUC, now at Tesla.
- [Simon \(Haochen\) Xia](#): B.S. Computer Engineering 2026 in UIUC.
- [Jerry \(Ruoxuan\) Wang](#): B.S. Computer Engineering 2024 in UIUC, now M.S. student at UPenn.
- [Justin Lin](#): B.S. Computer Engineering 2023 in UIUC, now at Capgemini.
- Zachary Mizrachi: B.S. Computer Engineering 2024 in UIUC.

Reviews

- Journal reviews: [IEEE T-RO](#), [IEEE RA-L](#), [SAGE IJRR](#), [IEEE TAI](#)
- Conference reviews: RSS, ICRA, IROS, CoRL, Humanoids

Teaching

Guest Lecturer

- [CS 343H: Artificial Intelligence: Honors \(Fall 2024\)](#)

Graduate Teaching Assistant

- ECE 598: Human-Centered Robotics (Fall 2020)
- ECE 470: Introduction to Robotics (Fall 2019 - Spring 2020)
- ECE 120: Introduction to Computing (Fall 2018 - Spring 2019)

Undergraduate Course Assistant

- ECE 110: Introduction to Electronics (Fall 2016 - Spring 2018)

Industry Experience

- Research Scientist Internship, Bosch Center for Artificial Intelligence Summer 2023
- Applied Scientist Internship, Robotics & AI, Amazon Summer 2022

References

- Katherine Driggs-Campbell, Assistant Professor in ECE department at UIUC
Email: krdc@illinois.edu
- Yuke Zhu, Assistant Professor in CS department at UT Austin
Email: yukez@cs.utexas.edu
- Nancy M. Amato, Abel Bliss Professor of Engineering and Department Head in CS department at UIUC
Email: namato@illinois.edu
- Kris Hauser, Professor in CS department at UIUC
Email: kkhauser@illinois.edu
- Junyi Geng, Assistant Professor in Aerospace Engineering department at The Pennsylvania State University
Email: jgeng@psu.edu