

Shuijing Liu

Contact

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Research interests

My vision is to enable robots to move beyond tool-like roles and instead collaborate with us as partners. Toward this vision, my research treats humans, the end-users and beneficiaries of robots, as essential stakeholders in **robot learning**. My work is centered around learning and deployment of **human-centered robotics** that infer and support human needs in the open world, operate robustly alongside human crowds, and adapt efficiently through natural interactions with humans.

Education

University of Illinois at Urbana-Champaign 2018 – 2024

Ph.D. in Electrical and Computer Engineering

Advisor: 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 the Highest Honor)

Appointments

The University of Texas at Austin 08/2024 – current

Postdoctoral scholar with Yuke Zhu, Peter Stone, and Joydeep Biswas

Municorn Inc 02/2025 – current

Artificial Intelligence Advisory Board

Honors and Awards

- [RSS Pioneers](#) 2025
“30 world’s top early-career researchers in robotics.”
- [Best Paper Award at ICRA 2025 Workshop on Advances in Social Navigation](#) 2025
- Early Career Scholars Postdoctoral Fellowship at UT Austin 2025
- [Rising Stars in FECS](#) 2024
“70 the world’s top researchers in EECS.”
- [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

Publications

* , † indicate equal contributions

Journal

1. **HEIGHT: Heterogeneous Interaction Graph Transformer for Robot Navigation in Crowded and Constrained Environments**
S. Liu, H. Xia*, F. C. Pouria*, K. Hong, N. Chakraborty, Z. Hu, J. Biswas, and K. Driggs-Campbell.
Conditionally accepted, IEEE Transactions on Automation Science and Engineering (T-ASE).
(Best Paper Award at ICRA 2025 Workshop on Advances in Social Navigation: Planning, HRI and Beyond)
2. **Developing Wayfinding Robotic Support for Older Persons with Vision Impairments**
S. A. Olatunji, M. A. Bayles, S. Liu, A. Hasan, K. Driggs-Campbell, and W. A. Rogers.
In Assistive Technology, 2025.
3. **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.

Conference

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.
In Conference on Robot Learning (CoRL), 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.
In Conference on Robot Learning (CoRL), 2025.
3. **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 Conference on Robot Learning (CoRL), 2025.
4. **Tool-as-Interface: Learning Robot Policies from Observing Human Tool Use**
H. Chen, C. Zhu, S. Liu, Y. Li, and K. Driggs-Campbell.
In Conference on Robot Learning (CoRL), 2025.
(Best Paper Award at ICRA 2025 Workshop on Foundation Models and Neural-Symbolic AI for Robotics)
5. **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.
6. **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.
Best Paper/Student Paper Award Finalist in Conference on Robot Learning (CoRL), 2023.
7. **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.
8. **Structural Attention-Based Recurrent Variational Autoencoder for Highway Vehicle Anomaly Detection**
N. Chakraborty, S. Liu*, A. Hasan*, T. Ji*, W. Liang, D. L. McPherson, and K. Driggs-Campbell.
In International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2023.

9. **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)
10. **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.
11. **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.
12. **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.
13. **Off Environment Evaluation Using Convex Risk Minimization**
P. Katdare, **S. Liu**, and K. Driggs-Campbell.
In International Conference on Robotics and Automation (ICRA), 2022.
14. **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.
15. **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.
16. **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.
17. **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.
18. **Robust Deep Reinforcement Learning with Adversarial Attacks**
A. Pattanaik, Z. Tang*, **S. Liu***, G. Bommannan, and G. Chowdhary.
In International Conference on Autonomous Agents and Multiagent Systems (AAMAS, Extended Abstract), 2018.

Preprints

1. **MimicDroid: In-Context Learning for Humanoid Robot Manipulation from Human Play Videos**
R. Shah, **S. Liu***, Q. Wang*, Z. Jiang*, S. Kumar, M. Seo, R. Martín-Martín, and Y. Zhu.
Under review, 2025.
2. **Beyond Canes and Guide Dogs: A Review of 40 Years of Robotics for Wayfinding, Navigating, and Orienting Assistance for People with Visual Impairments**
J. Pohovey, M. Lusardi*, A. Hasan*, **S. Liu†**, A. Schreiber†, S. A. Olatunji, W. A. Rogers, and K Driggs-Campbell.
Under review, 2025.
3. **Gotta Scoop 'Em All: Sim-and-Real Co-Training of Graph-based Neural Dynamics for Long-Horizon Scooping**
K. Hong, H. Chen*, R. Wang*, K. Wang*, M. Zhang, **S. Liu**, Y. Zhu, Y. Li, K. Driggs-Campbell.
Under review, 2025.

Invited Talks

- **From Tools to Partners: In-the-Wild Learning and Deployment of Human-Centered Robotics**
University of Southern California, 2025.
University of California, Los Angles, 2025.
- **Structured Interaction Models Enables Human-Robot Coexistence in the Wild**
University of Utah, 2025.
- **Learning Structured Interaction Models for Robot Navigation in Human Environments**
[RobotiXX Lab](#), George Mason University, 2024.
[Stanford Intelligent Systems Laboratory \(SISL\)](#), Stanford University, 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](#)
- Co-organizer of [ICRA 2026 Workshop on Bridging the Gap between Robot Learning and Human-Robot Interaction](#)

Students mentored

- Ph.D. and Master students
 - [Haonan Chen](#): Ph.D. Electrical and Computer Engineering, UIUC → postdoctoral scholar at Harvard University.
 - [Huihan Liu](#), Ph.D. Computer Science, UT Austin.
 - [Rutav Shah](#), Ph.D. Computer Science, UT Austin.
 - [Zichao Hu](#), Ph.D. Computer Science, UT Austin.
 - [Michael Munje](#), Ph.D. Computer Science, UT Austin.
 - [Kaiwen Hong](#): Ph.D. Electrical and Computer Engineering, UIUC.
 - [Neeloy Chakraborty](#): Ph.D. Electrical and Computer Engineering, UIUC.
 - [Eric \(Weihang\) Liang](#): M.S. Electrical and Computer Engineering, UIUC → Tesla.
- Undergraduate students
 - [Michael \(Pengen\) Zhang](#), B.S. Computer Science, UT Austin.
 - [Masamu Oshita](#), B.S. Computer Science 2027 in UT Austin.
 - [Simon \(Haochen\) Xia](#): B.S. Computer Engineering 2026 in UIUC.
 - [Jerry \(Ruoxuan\) Wang](#): B.S. Computer Engineering 2024 in UIUC → M.S. student at University of Pennsylvania.
 - [Justin Lin](#): B.S. Computer Engineering 2023 in UIUC.

- Zachary Mizrachi: B.S. Computer Engineering 2024 in UIUC.

Reviews

- Journal reviews
 - IEEE Transactions on Robotics (T-RO)
 - IEEE Robotics and Automation Letters (RA-L)
 - SAGE International Journal of Robotics Research (IJRR)
 - IEEE Transactions on Artificial Intelligence (TAI)
 - IEEE Transactions on Network Science and Engineering (TNSE)
 - IEEE Transactions on Human-Machine Systems (THMS)
- Conference reviews
 - Robotics: Science and Systems (RSS)
 - IEEE International Conference on Robotics and Automation (ICRA)
 - IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
 - Conference on Robot Learning (CoRL)
 - IEEE-RAS International Conference on Humanoid Robots (Humanoids)
 - AAAI Conference on Artificial Intelligence (AAAI)

Other service

- Mentor in Robotics: Science and Systems (RSS) Pathway Program 2025
- Ph.D. Admission Committee at UT Austin 2024
- Volunteer at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2023

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 Teaching Assistant

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

Industry Experience

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

References

- Katherine Driggs-Campbell
Associate Professor of Electrical and Computer Engineering at UIUC
Email: krdc@illinois.edu
- Yuke Zhu
Associate Professor of Computer Science at UT Austin
Email: yukez@cs.utexas.edu

- Nancy M. Amato
Abel Bliss Professor of Engineering and Director of the Siebel School of Computing and Data Science at UIUC
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