# Shuijing Liu

PhD Candidate

Electrical and Computer Engineering

University of Illinois Urbana-Champaign

Research interests: Learning-based Robotics, Human-Robot Interaction, Machine Learning

## Contact

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## Education

**University of Illinois at Urbana-Champaign** 2018 – Exp. May 2024

Ph.D. in Electrical and Computer Engineering

Advisor: Prof. Katherine Driggs-Campbell

Thesis (Tentative): Robot Navigation in Interactive Environments with Structured Behavior Models

**University of Illinois at Urbana-Champaign** 2014 – 2018

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

Undergraduate Senior Thesis: Prostate Cancer Diagnosis with Deep Learning

## Publications

*, † indicate equal contributions

1. **DRAGON: A Dialogue-Based Robot for Assistive Navigation with Visual Language Grounding**
   **S. Liu**, A. Hasan, K. Hong, R. Wang, P. Chang, Z. Mizrachi, J. Lin, D. L. McPherson, W. A. Rogers, and K. Driggs-Campbell.
   In Robotics and Automation Letters, 2024.
2. **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 Student Paper Award Finalist)
3. **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.
4. **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.
5. **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)
6. **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.

7. **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.
8. **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.
9. **Off Environment Evaluation Using Convex Risk Minimization**
   P. Katdare, **S. Liu,** and K. Driggs-Campbell.
   In International Conference on Robotics and Automation (ICRA), 2022.
10. **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.
11. **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.
12. **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.
13. **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.
14. **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 (Extended Abstract), 2018.

## Honors and Awards

- 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

- **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

### Students mentored

- 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.
- Jerry (Ruoxuan) Wang: B.S. Computer Engineering 2024.
- Justin Lin: B.S. Computer Engineering 2023, now Master student in UIUC.
- Zachary Mizrachi: B.S. Computer Engineering 2024.

### Reviews

- Journal reviews: IEEE T-RO, IEEE RA-L, SAGE IJRR, IEEE TAI
- Conference reviews: RSS, ICRA, IROS, Humanoids

## Teaching

### 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

- Nancy M. Amato, Abel Bliss Professor of Engineering and Department Head in CS department at UIUC

  Email: namato@illinois.edu

- Saurabh Gupta, Assistant Professor in ECE department at UIUC

  Email: saurabhg@illinois.edu

- Junyi Geng, Assistant Professor in Aerospace Engineering department at The Pennsylvania State University

  Email: jgeng@psu.edu