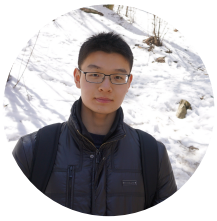
SHENGJIE LIN



Ph.D. Candidate in Robotics, Computer Vision, and Machine Learning

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I am interested in developing algorithms that enable robots to perceive and interact with their surroundings in a natural and intuitive way. My research efforts have been recently dedicated to 3D scene reconstruction and understanding, with a focus on scalable representation and natural language interaction for embodied agents. Through numerous comprehensive projects, I have also gained considerable practical experience in software development with various frameworks and tools, especially for robotic applications.

PROJECTS

Baxter Pose Following

Empower the Baxter robot to follow a human's pose.

2022/02—2023/06

The project was showcased at the Museum of Science and Industry in Chicago for the 2022 and 2023 National Robotics Week, and was invited for regular exhibition.

- Use RTMPose-m for SOTA real-time pose detection.
- Robustly track and focus on a highlighted pose over time.
- Solve Baxter's joint configuration for pose following.
- Parallel threaded execution for responsive performance.

Code as Policies on UR5

Implementation of Code as Policies on the UR5 robot.

2023/02—2023/04

The project was presented during the 2023 National Robotics Week at the Museum of Science and Industry in Chicago.

- Robust speech-to-text as input aided by wake-up-word mechanism and dynamic ambient sound adaptation.
- Flexible robot action as output via GPT code generation.
- Open-vocabulary visual pick & place enabled by MDETR.
- Pertinent object grasping based on point-cloud analysis.

Infant

Artistic reaction of a digital infant to external stimuli.

2020/03—2020/11

The project was featured in the 2020 SAIC Shows.

- Interact with the audience via multi-modal perception, including vision, audio, touch and pulse sensing.
- The reflection of external stimuli on the infant is designed with both philosophical and realistic considerations.
- Powered by neural style transfer, the infant's state is visualized via the gradation of art style in its skin texture.

Baxter Rubik's Cube

Solve a Rubik's Cube with the Baxter robot.

2019/02—2019/04

The project was presented during the 2019 National Robotics Week at the Museum of Science and Industry in Chicago.

- Follow programmed routine to pick up and scan the cube.
- Determine the color grids with a clustering-based method.
- Execute Kociemba's cube solution via visual servoing.
- Visualize the cube state and solution step in 3D graphics.

PUBLICATIONS

* denotes equal contribution.

- T. Yoneda*, J. Fang*, P. Li*, H. Zhang*, T. Jiang, **S. Lin**, B. Picker, D. Yunis, H. Mei, and M. R. Walter, "Statler: State-maintaining language models for embodied reasoning," in *IEEE International Conference on Robotics and Automation*, 2024. arXiv: 2306.17840 [cs.RO].
- J. Fang*, **S. Lin***, I. Vasiljevic, V. Guizilini, R. Ambrus, A. Gaidon, G. Shakhnarovich, and M. R. Walter, "Nerfuser: Scalable scene representation by nerf registration and blending," in *ICLR Workshop on Neural Fields across Fields*, 2023. arXiv: 2305.13307 [cs.CV].
- J. Fang*, X. Tan*, **S. Lin***, H. Mei, and M. R. Walter, "Transcrib3d: 3d referring expression resolution through large language models," in *CoRL Workshop on Language and Robot Learning*, 2023.

EDUCATION

Ph.D. Candidate in Computer Science

Toyota Technological Institute at Chicago

2017/10—Present

B.Sc. in Electronic Engineering

Tsinghua University

2013/08—2017/07

Awards

- Outstanding Undergraduate at EE Dept.
- Outstanding Thesis at EE Dept.
- 2014–2016 Scholarship for Overall Excellence

TEACHING

Teaching Assistant

- TTIC 31170: Planning, Learning and Estimation for Robotics and Artificial Intelligence

SKILLS

ROS | Nerfstudio | OpenCV | Open3D | PyTorch | PyBullet | Python | GPT | Git | Linux Shell | Docker | Singularity | Slurm