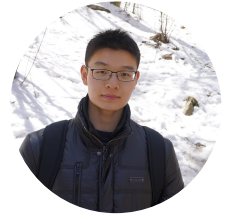# SHENGJIE LIN

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

@ slin@ttic.edu 📞 773-886-6932 ✉ 6045 S. Kenwood Ave. Chicago, IL 60637
📍 Toyota Technological Institute at Chicago 🌐 shengjie-lin.github.io ⬡ shengjie-lin

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 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 had the honor to stay in the Museum for regular exhibition since summer 2023.
- 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 UR5e
Implementation of Code as Policies on the UR5e 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.
- Reflection of external stimuli on the infant is designed with 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
Solving 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.
- J. Fang*, **S. Lin***, I. Vasiljevic, V. Guizilini, R. Ambrus, A. Gaidon, G. Shakhnarovich, and M. R. Walter, *Nerfuser: Large-scale scene representation by nerf fusion*, 2023. arXiv: 2305.13307 `[cs.CV]`.
- J. Fang*, **S. Lin***, I. Vasiljevic, V. C. Guizilini, R. A. Ambrus, A. Gaidon, G. Shakhnarovich, and M. Walter, "Nerf registration, blending and fusion," in *ICLR Workshop on Neural Fields across Fields*, Kigali, Rwanda, 2023.
- J. Fang*, X. Tan*, **S. Lin***, H. Mei, and M. R. Walter, "Transcribe3d: Grounding llms using transcribed information for 3d referential reasoning with self-corrected finetuning," in *CoRL Workshop on Language and Robot Learning*, 2023.
- 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*, 2023. arXiv: 2306.17840 `[cs.RO]`.

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 Graduate 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