HOUJIAN YU

(858)203-8364 | yu000487@umn.edu | Website | LinkedIn | Github

EDUCATION

University of Minnesota, Twin Cities — Minneapolis, MN, USA
Doctor of Philosophy in Computer Engineering — Sept. 2020 – Exp. May 2025

University of California, San Diego — La Jolla, CA, USA
Master of Science in Electrical and Computer Engineering — Sept. 2018 – Mar. 2020

North China Electric Power University — Beijing, China
Bachelor of Engineering in Electrical Engineering — Sept. 2014 – Jun. 2018

WORK EXPERIENCES

Applied Scientist Intern — May 2024 – Aug 2024
Amazon Lab126 — Sunnyvale, CA

- Developed a language-guided robot grasping pipeline handling open-vocabulary descriptions and spatial reasoning for grasping affordance prediction
- Achieved a 93.4% robot grasping success rate with the spatial reasoning related task in simulation

Robotics Research Assistant [website] — Sept. 2020 – Present
Choice Robotics Lab, University of Minnesota — Minneapolis, MN

- Proposed a robot-assisted interactive segmentation pipeline to solve the novel object segmentation problem
- Developed deep RL-based approaches for object separation and target-driven robot manipulation

SELECTED PROJECTS

Mutimodal Robot Grasping with Spatial Reasoning — Sept. 2023 - Aug. 2024

- Proposed a parameter-efficent tuning CLIP-based framework for multimodal vision-language feature fusion
- Learned a pixel-language representation for spatial-aware grasping affordance prediction
- Achieving an 88% grasping success rate on 32 YCB objects with complex spatial reasoning in simulation

Visual-Language Attribute-based Robotic Grasping — Jan. 2023 - Aug. 2023

- Implemented a multimodal encoder to fuse the language attributes with visual inputs
- Learned a multimodal embedding space with triplet loss, enforcing a closer representation between the grasped object and the attribute feature vector
- Achieving an 80% grasping success rate on 34 novel YCB objects in simulation

SKILLS

Programming: Python, MATLAB, Java, C/C++
Deep Learning and Robotics: PyTorch, **OpenCV**, **ROS**, PyTorch-Geometric, Tensorflow, Keras, scikit-learn, Gym, MuJoCo, Coppeliasim, PyBullet
Courses: Robotics Vision, **Sensing and Estimation in Robotics**, **Intelligent Robotic Systems**, Advanced Algorithms and Data Structures, Computer Architecture

SELECTED PUBLICATIONS

Houjian Yu et al., "A Parameter-Efficient Tuning Framework for Language-guided Object Grounding and Robot Grasping", IEEE International Conference on Robotics and Automation (ICRA), 2025 [website, pdf]

Yang Yang*, **Houjian Yu*** (*joint first authors), et al., "Attribute-Based Robotic Grasping with Data-Efficient Adaptation", IEEE Trans on Robotics (T-RO), 2024 [website, pdf]

Houjian Yu et al., "IOSG: Image-driven Object Searching and Grasping", IEEE/RSJ International Conference on Intelligent Robots (IROS), 2023 [website, pdf]

Houjian Yu et al., "Self-Supervised Interactive Object Segmentation Through a Singulation-and-Grasping Approach", European Conference on Computer Vision (ECCV), 2022 [website, pdf]