Dayou Li

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Education

School of Control Science and Engineering, Shandong University *Jinan, China*

M.Eng. in Control Engineering *Sept. 2022 - Present*

Supervisor: Prof. Wei Zhang

GPA: 87/100

School of Engineering, Northeast Agriculture University *Harbin, China*

B.Eng. in Mechanical Engineering *Sept. 2018 - Jun. 2022*

GPA: 88/100

Ranking: 1/18 (Agricultural Mechanization and Automation Experimental Class)

Publications

[1] **Dayou Li**, Chenkun Zhao, Shuo Yang, Ran Song, Xiaolei Li, Wei Zhang, "MPGNet: Learning Move-Push-Grasping Synergy for Target-Oriented Grasping in Occluded Scenes", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Abu Dhabi, UAE, 2024. [video]

[2] Pengkun Wei, Shuo Cheng, **Dayou Li**, Ran Song, Yipeng Zhang, Wei Zhang, "Coarse-to-Fine Detection of Multiple Seams for Robotic Welding", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Abu Dhabi, UAE, 2024. [video]

[3] **Dayou Li**, Chenkun Zhao, Shuo Yang, Lin Ma, Yibin Li, Wei Zhang, "Learning Instruction-Guided Manipulation Affordance via Large Models for Embodied Robotic Tasks", IEEE International Conference on Advanced Robotics and Mechatronics (ICARM), Tokyo, Japan, 2024. [video]

[4] **Dayou Li**, Pengkun Wei, Chenkun Zhao, Shuo Yang, Yibin Li, Wei Zhang, "A Mobile Manipulation System for Automated Replenishment in the Field of Unmanned Retail," IEEE International Conference on Mechatronics and Automation **(ICMA Best Paper Finalist)**, Harbin, China, 2023. [paper][video]

[5] Shuo Yang, **Dayou Li**, Chenkun Zhao, Pengkun Wei, Yibin Li, Wei Zhang, "Multi-class 4-DoF Carton Box Detection for Heterogeneous Robotic Container Unloading," IEEE International Conference on Real-time Computing and Robotics **(RCAR Best Paper Finalist)**, Datong, China, 2023. [paper][video]

[6] Chenkun Zhao, Shuo Yang, **Dayou Li**, Ran Song, Xiaolei Li, Pengkun Wei, Wei Zhang, "DynamicDiffusion: Scaling Instruction-Guided Object Rearrangement via Large Models," IEEE/ASME Transactions on Mechatronics (TMECH), in submission, 2024.

Projects

3D Bin Packing and Unpacking in Logistics Industry *Aug. 2022 - Apr. 2023* [Demo]

- Developed and implemented algorithms for robotic depalletizing and offline palletizing, and validated them in both simulation and real-world environments.
- Solved the problem of rotational container detection with a small number of real samples by building a simulation data set.
- Successfully deployed the technology in BlueSword Co., Ltd's pilot plant, achieving positive results.

Vision-Based Intelligent Welding Robot *Oct. 2022 - Present* [Demo]

- Developed vision-based intelligent welding robots in collaboration with Aotai Electric Co., Ltd.
- Proposed an automatic welding pipeline that integrates RGB images and point cloud data to generate precise welding paths, enhanced with a laser seam tracker.
- Successfully tested the system in both laboratory and factory environments, with a paper accepted to IROS 2024.

Language-Guided Mobile Robotic Manipulation *Nov. 2023 - Mar. 2024* [Demo]

- We developed a visual scene representation using large visual-language models to generate feature representations that align map information with natural language queries, enabling the identification of the most relevant destinations based on instructions.
- Our system integrates large language models to parse language instructions into actionable sequences for robotic navigation, facilitating goal-directed tasks by querying the scene representation.
- We implemented our approach on a composite mobile robot from RealMan Intelligent Technology Co., Ltd, enhancing its capabilities with an added lifting function.

Review Service

Conference: IROS 2024, ICARM 2024, ICRA 2024, ICMA 2023
Journal: T-ASE

Contests and Honors

- Merit Student Scholarship, Northeast Agricultural University (2 times), 2019-2022
- Second Prize, National Undergraduate Mathematical Contest in Modeling (China), 2021
- Second Prize, National Mathematics Competition (China), 2021
- Academic Scholarship, Shandong University (2 times), 2022-2024

Skills

Language Chinese (native), TOEFL-iBT: 104 (R:28, L:29, S:23, W:24)
Coding Python (PyTorch, OpenCV, Open3d, etc), C++
Software SolidWorks, CoppeliaSim, Isaac Sim