Dayou Li

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Education

M.Eng. in Control Engineering **Sep.2022 - present**
School of Control Science and Engineering, Shandong University(project 985) Jinan, China
Supervisor: Pro. Wei Zhang
GPA: 88/100
Core Courses: Big data analytics(93), Optimization Methods(99), Linear System Theory(95)
B.Eng. in Mechanical Engineering **Sep.2018 - Jun.2022**
School of Engineering, Northeast Agriculture University(project 211) Harbin, China
GPA: 87.6/100
Ranking: 1/18 (Mechanical Engineering and Automation in Agriculture Experimental Class)
Core Courses: Advanced Mathematics(99), Material Mechanics(96), Automatic Control Theory(95), Principle of Mechanics(92), Theoretical Mechanics(89), Hydraulic and Pneumatic Transmission(92)

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 Transactions on Artificial Intelligence (T-AI), under review, 2024.

Projects

3D Bin Packing and Unpacking in Logistics Industry [Demo]

Since August 2022, facing the actual project requirements of BlueSword Co., Ltd, we have carried out a series of work such as robotic depalletizing, robotic online and offline palletizing, communication, and interaction development between WCS and the host computer. The relevant algorithms were deployed and verified in the simulation environment and the real environment of the lab, and then were actually deployed in the pilot plant of BlueSword, which has achieved good results.

Vision-Based Intelligent Welding Robot [Demo]

Based on the cooperation with Aotai Electric Co., Ltd, we have developed a set of vision-based intelligent welding robots. We propose an automatic welding pipeline that synthesizes RGB images and point cloud information to generate welding paths and combine them with a laser seam tracker for precision welding. We have already tested it in the lab and in the factory. A related paper has been submitted to IROS2024.

Designing Mobile Platform for Language-Guided Robotic Manipulation [Demo]

We present a visual scene representation built with large visual-language models to generate a feature representation of the environment that can match map information with natural language queries, which will be used to highlight the destinations that are most relevant to the instructions. Combined with large language models, our system can parse language instructions into action sequences for a robot to follow, and accomplish goal navigation with querying the scene representation. In practice, we chose the composite mobile robot from RealMan Intelligent Technology Co., Ltd and added a 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, C++