CS6301 Introduction to Robot Manipulation and Navigation Project Presentation and Final Report

Professor Yu Xiang

November 18, 2024

1 Presentation

The project presentations will be held on 12/2 and 12/4. The assignments of the groups are

- 12/2, Monday, Groups: 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
- 12/4, Wednesday, Groups: 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25

The list of projects:

- Group 1: Automated Chessboard Setup: Model-Based Manipulation of Chess Pieces
- Group 4: Trajectory-Aware Human Feedback for Efficient Hierarchical Reinforcement Learning in Robotics
- Group 5: Dynamic Object Sorting & Placement Using Model-Based Grasping
- Group 6: Carrybox with Ros Vacuum Gripper Plugin
- Group 7: The Dinnerware Distributor
- Group 8: 2D Deterministic Path-based Dynamic Object Grasping
- Group 9: Trajectory simulation for robot-assisted prostate biopsy system
- Group 10: Cup Stacking
- Group 11: AgriSort
- Group 12: Robot Grasping and Sorting Using User-Defined Categories
- Group 13: Autonomous Trash Collection System with Mobile Manipulation
- Group 14: From Command to Completion: Implementing Language-Driven Planning Strategies in Autonomous Robotics
- Group 15: Robot Grasping and Mobile Manipulation of Badminton Birdies
- Group 16: Implement of Model-based Grasping

- Group 17: Robotics-Based Medication Delivery System in Hospitals

- Group 18: Voice-Controlled Robotic Manipulation

- Group 19: Object Retrieval Robot: Autonomous Navigation and Manipulation in Unknown Environment

- Group 20: Simulated Environment for Language-Guided Robot Manipulation using Natural Language Commands

- Group 21: Enhancing Robotic Grasping through Prompt Learning in a Missing Stream Environment

- Group 22: Reinforcement Learning For Grasping and Manipulation of Top Open Liquid Containers

- Group 23: Improved Ant Colony Navigation

- Group 24: Robotics-Based Mobile Manipulation System for Grocery Assistance

- Group 25: Learning Robotic Manipulation from Videos Priors via Task-Agnostic Reward Function

Each group has 6 minutes for the presentation and questions. Please use slides to describe your project, and show a demo of the project if you have one.

Make sure you practice your presentation beforehand. A timer will be used. You will have to stop the presentation if you run over 6 minutes.

Evaluation criteria: The grading will be based on the overall quality of the presentation in terms of content, clarity, and question answering.

2   Final Report

The project final report should be prepared using the the ICRA double column latex format. A useful online LaTex tool is Overleaf `https://www.overleaf.com/`. We have the ICRA latex template accessible here via overleaf: `https://www.overleaf.com/read/rwmhwnwjkrmc`. You can download a copy of the template or make a copy in overleaf for your own project, and then edit it.

In this project final report, please describe the following items according to your project:

- **Title**. The title of your project.

- **Team Members**. List the names of the team members.

- **Abstract**. Give an overview of the project.

- **Introduction**. Describe the motivation of the project, i.e., why do you want to work on this problem. Then describe an overview of the framework/method/system.

- **Related Work**. Discuss the related work of your project.

- **Method**. Describe your solution for the project. For example, describe each component of the framework in details. Try to use figures to illustrate the method instead of only using text. "A picture is worth a thousand words".

- **Experiments**. In this section, you can first describe the simulation environments or datasets and evaluation metrics. Then describe what experiments you have done for the project by adding experimental results to the report. Use figures and plots to show these results.

- **Conclusion**. Describe the take-home messages of the project and conclude the report.

- **References**. Cite related works in the report.

Evaluation criteria: The grading will be based on the overall quality of the report in terms of writing, content and clarity.

Minimum page requirement: 4 pages. The report should be at least 4 pages with the ICRA format (excluding references, i.e., without references, the content should be at least 4 pages). You can go beyond 4 pages, but make sure it is less than 6 pages (excluding references).

An example ICRA paper: you can check the structure of the following paper for reference `https://yuxng.github.io/Papers/2020/meng_icra20.pdf`.

3 Project Submission

Please submit the following items to eLearning. You can zip all the files.

- (Required) Final report in pdf format
- (Required) Presentation slides in pdf format (Do not have UNet IDs in it for releasing online)
- (Required) Source code of your project
- (Required) A demo video in mp4 format