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

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1 Presentation

The project presentations will be on 12/5 and 12/7. The assignments of the groups are

- 12/5, Monday, Groups: 1, 2, 3, 4, 6, 7, 9, 10, 11
- 12/7, Wednesday, Groups: 5, 12, 13, 14, 15, 16, 17, 18, 20

The list of projects:

- Group 1: Goal-driven Autonomous Exploration
- Group 2: Obstacle Avoidance using ROS Navigation Stack
- Group 3: 6D Model-Free Mug Grasping Planning
- Group 4: Target-Driven Robot Navigation using Deep Reinforcement Learning for Mapless Navigation
- Group 5: Grasping Manipulation for Throwing a Ball under Constraints
- Group 6: Produce Segregation On Industrial Supply Chain Using Object Manipulation Algorithm
- Group 7: Reinforcement Learning for Obstacle Navigation While Hydroplaning
- Group 9: Snack Helper
- Group 10: Target-driven Navigation
- Group 11: ASKGRASP: Is this grasp suitable for performing a task on a particular object?
- Group 12: Screws, Nuts, and Bolts Sorting with Model-Based Top-down Grasping
- Group 13: Comparison of Different Navigation Methods in Habitat
- Group 14: Indoor Navigation for Office Space
- Group 15: Navigation and Object Detection Using a Custom-Built Robot

- Group 16: Home Bot

- Group 17: Target Based Navigation using ROS Navigation Stack

- Group 18: Target-Driven Visual Navigation in Outdoor Environment

- Group 20: Target-driven Visual Navigation in Indoor Scenes using Deep Reinforcement Learning: A Pytorch Implementation

Each group has 8 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 8 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
- (Required) Source code of your project
- (Required) A demo video in mp4 format