Fall 2024 - CSC398 Autonomous Robots - Assignment 8



Due date: 12/02/2024, 11:59pm. This assignment is worth 20 points.

This assignment is worth 20 points and is due by midnight on Monday, December 2nd, 2024. The primary objective of this exercise is to complete the perceive-think-act-cycle on the HSR. We will utilize the outcomes of assignments 5-7 to **pick-and-place** an object.

1. We made some small modifications to the simulation world. `git pull` (from your catkin workspace) to update.
2. `cd` into the `src/` directory off your catkin workspace. Clone the new assignment: `git clone` https://classroom.github.com/a/IntK7h26. You will find a starter code there.
3. Run the simulator with `./isaac_sim_hsr_final_start.sh`
4. `cd` into your assignment-8 repo. `cd` into `scripts` directory. Run `init_package.py`. This will adjust your package naming. Remake the workspace and source.
5. In the `scripts` directory use, find `picking_students.py` as the foundation of your code.
6. In this assignment, you will integrate the knowledge gained from your previous assignments. First, you must localize your robot utilizing the solution provided in Assignment 5.
7. Once your robot is localized, you will use motion from assignment 6 to go to three different locations: (0.9, 2.0, 1.57), (1.0, 4.0, 0.0) (2.0, 4.0, -1.57) – in (x, y, θ) coordinates.
8. There will be objects on the floor at each location. You will use your vision model from assignment 7 to find one of the following objects: `orange`, `peach` or `Rubick's cube`.
9. Once you have located the object, utilize and adapt the provided package for this assignment to **pick** up the object you have discovered.
10. Finally, utilizing the knowledge gained in Activity 2, you will **place** your item to the designated coffee table.
11. Once completed, write a summary (one paragraph) on how you connected all the pieces from the assignments to achieve the goal of this exercise.
12. Add, commit and push the modifications to the provided package to GitHub Classroom.
13. During our class session on December 3rd, 2024, we will review all the solutions submitted. The most effective solution will be demonstrated on the robot in the laboratory.