Sebastian Ren Individual Report

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In this project, I was primarily responsible for the design and development of the program. Starting from scratch, I taught myself PyBullet and URDF file adjustments by exploring and reading various resources. Since the two grippers used in the project differed in size and needed to match the objects, I specifically adjusted the scaling of the grippers and URDF files.

I began by implementing a standalone function for the PR2 gripper to collect data on a single object, the cube. Later, I migrated these functions into a class structure and added the second gripper, the Three Finger Gripper (F3). Using the abstract class methods I designed, data collection on different objects could be easily performed by simply writing the code for controlling the gripper's opening and closing mechanisms. I successfully integrated the entire data collection process into the abstract class, making it streamlined and modular. Additionally, I designed both GUI and NoGUI modes—GUI mode for debugging and NoGUI mode for data collection. However, the GUI can also be enabled for data collection by adjusting the code, providing flexibility and convenience.

To demonstrate the differences in generalization capabilities between the PR2 and F3 grippers, I deliberately selected two objects with varying difficulty levels: the cube and the duck. In the report, I spent considerable time documenting the workflow of the system and creating simplified flowcharts and UML diagrams to illustrate the program's design. The entire process was very time-consuming, even though the report itself is not very long because I'm currently too tired to recall everything in detail. It took a significant amount of effort as I had to learn everything from scratch and spent a lot of time working on the 'Robotsimulator' file, particularly on path planning, since I initially thought we needed to integrate the gripper with a robotic arm.

No one writes better code than I do.(Trump face)