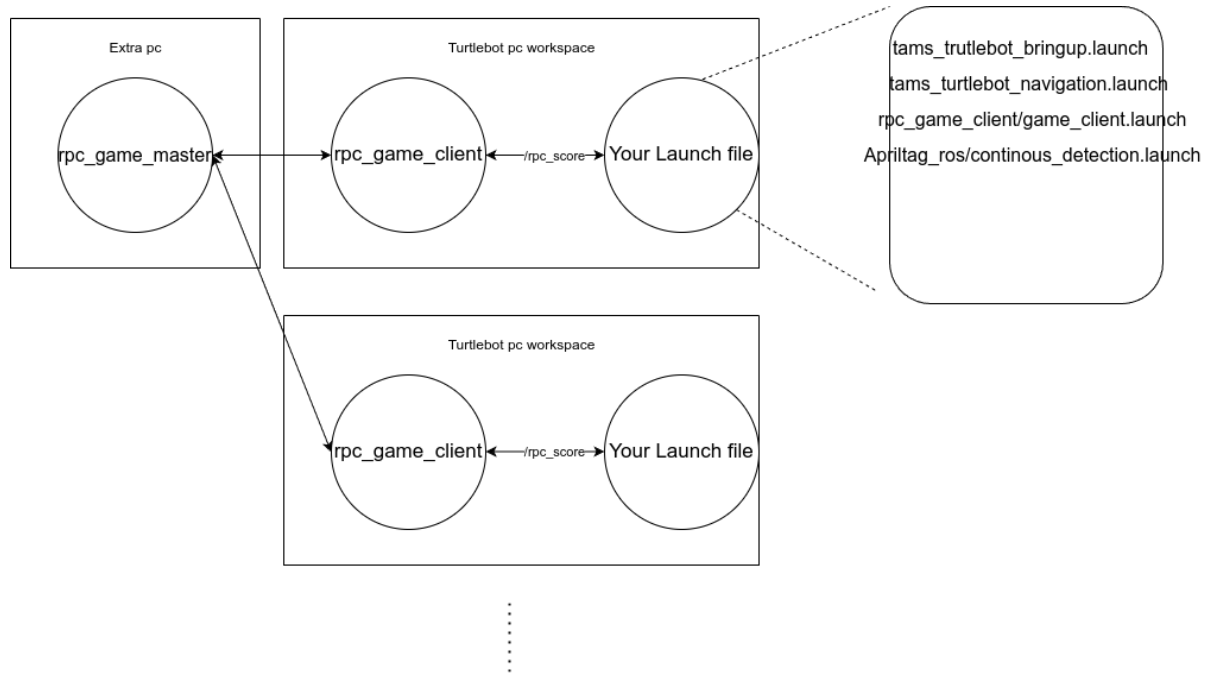


Assignment 4 Supplement Material

Q: How would the whole rpc game running in framework perspective?

Ans:



Q: What is Apriltag, and how would it work?

Ans: The Apriltag using apriltag_ros package (https://wiki.ros.org/apriltag_ros), which gives you a handy way of processing the camera information toward the correct pose based on the based link. The detail can look into the Apriltag3 repository (<https://github.com/AprilRobotics/apriltag>) which we use the family of tagCustom48h12.

Choosing a Tag Family

For most applications, the tagStandard41h12 family is the best choice. You can find tag images in the [apriltag_imgs repo](#). Simply scale up these images in your preferred editor and print them out.

Here are some guidelines for choosing other tag families:

1. Use tagStandard52h13 if you need more tags.

2. For maximizing space on small circular objects, opt for tagCircle49h12 (or tagCircle21h7).
3. Choose tagCustom48h12 for creating recursive tags.
4. If you need compatibility with the ArUco detector, use tag36h11.

The number of 48 in family name "tagCustom48h12" is using 48 bits to record the unique code. E.g. 0000010010000...001 in 48 bits would be the one. The h12 means the hamming distance of 12 which means for each unique Apriltag in the family should at least have 12 digits difference.

Q: What will be the ROS package to help us process Apriltag?

Ans: Using Apriltag_ros/continuously_detection.launch would be the great idea.

Q: How to test if our Apriltag code is working?

Ans: Using the printed Apriltag for you and try on your robot to do the task to recognize the Apriltag and try to make the robot follow the Apriltag.

Q: What is an important topic we would use to communicate with each rpc_game_client?

Ans: Check the topic of `/rpc_score` after you launch the client by `roslaunch rpc_game_client game_client.launch` command, which is already installed in your workspace on each Turtlebot.

Q: What is the strategy to win the game?

Ans: Here is some suggestion idea for you

- Patrolling mode: to discover the environment
- Locating mode: to localize where the robot is
- Hunting mode: to start submitting the other robots Apriltag to the score system
- Defense mode (Optional): How to defense from other robots' attack

