In Projects 1&2, you have built both joint mode control and world mode control for the robot manipulator. In this project, you are required to build a tele-operation system. You need to modify your code to allow it function as either Server or Client for the task. You should design a communication protocol that based on TCP socket so that Server and Client can run at different computers.

Functionalities required for tele-operation are,

- You need to design a client-server architecture.
- As client, it should be able to connect to a specific IP address that specifies the server.
- After the connection between the client and the server is established, the robot motion in each side should be synchronized. (e.g., if you control the master robot at one side, the robot at slave side should move accordingly and instantaneously.) This is call non-delayed mode.
- In addition, you should have a setup to allow the program to simulate time delay of 2 seconds. In other words, once the robot receives a command, it does not execute the command immediately. Instead, it waits two seconds before executing the command. Your interface should clearly indicate whether your program is in delayed mode or non-delayed mode.
- Both joint mode control and world mode control should function properly.

Grading is based on in-class demonstration (60pts), project website (20pts), and peer reviews (20pts). **No project report is required for this project.** There will be a paint-job competition in class to test your PaintBot. The wining team will get 5pts additional bonus point. To qualify for the competition, each team should have two laptops to set the test up in class.

The project requirements are,

1. Create sub directories for project 3 on your project website.
2. Complete a successful project demo in class (60pts)
3. Team member task allocation for current project. (5pts)
4. Team meeting log for current project. (5pts)
5. Source code for current project and instructions for compiling. (5pts)
6. Screenshot of the software interface of current project. (5pts)
7. Peer Review (20 pts): You will be able to find a peer review form in our course website. **Note this each student needs to submit his/her own form. Grading will be based on overall score that your teammates evaluate you. The deadline for turn in your peer review form is the same as the project deadline. Failure to submit peer review form before the deadline will be assigned to the lowest score in the team for the individual.** The link to the peer review form can be found in class website. In the peer review form, there are two main parts: personal evaluation (10 pts) and technical evaluation (10 pts).