Computer Project #2: Instructions for RobotStudio

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After running your MATLAB script to generate the joint angles required to reach the given points, you will likely want (and are highly encouraged) to test your results. A workspace has been designed in RobotStudio to aid in testing your program. To visually see the location of the end-effector using your generated *angles* file, you will need to do several steps:

1. Unpack the RobotStudio Workspace

2. Import trajectory points into RobotStudio

3. Simulate the *angles* file

The following material will provide step-by-step instructions for each task.

Unpacking Workspace:

1. Download the *project2.rspag* file from the course website.

2. Unpack the *project2.rspag* file:

   (a) Right mouse click on the *project2.rspag* and select *Open with RobotStudio 6.01*.

   (b) RobotStudio will open and the *Unpack & Work Wizard* will appear automatically. Click 'Next' as indicated by the red box in Fig. 1.
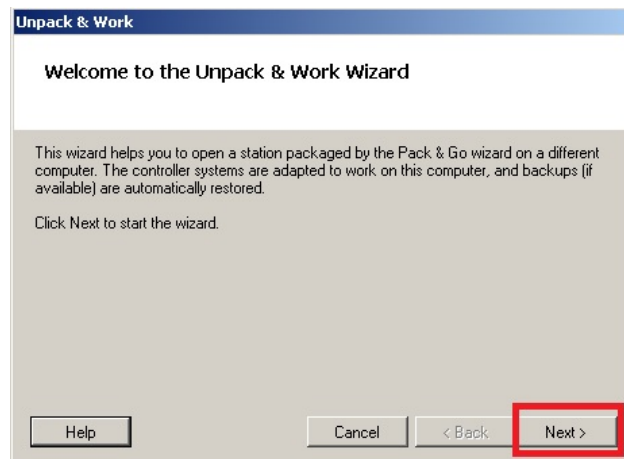

Figure 1: Unpack & Work Window - click 'Next'

3. On the next menu, Fig. 2, select your project folder as the *Target folder* then click *Next*.

4. For the *Controller Systems* menu, click *Next* again and then *Finish* for the *Ready to unpack* screen. Patiently wait for the system to unpack the folder then click *Close* when the system is finished.

The unpacking process will generate four folders at the location you specified: Backups, Libraries, Stations, and Systems. Inside *Systems/System/HOME* there will be several important files, namely:
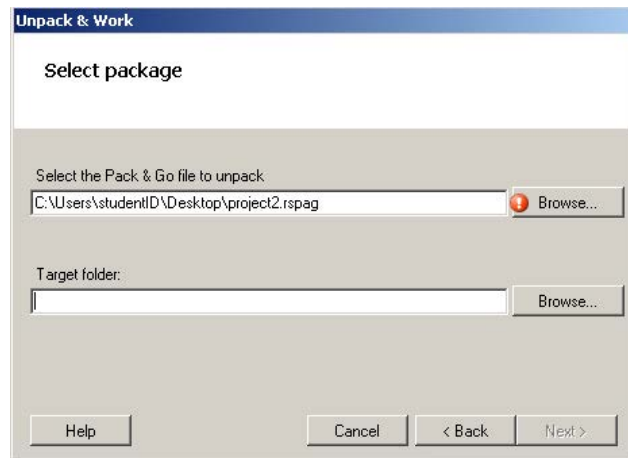
Figure 2: Select your project folder as the *Target folder*

- trajectory.txt

- arm.txt

- positiongenerator.m

Note: It is important to make sure the *angles* file you generate in MATLAB is located inside *Systems/System/HOME* so RobotStudio can access the values. As such, it is recommended to place all other files used (including .m and .wrl files) inside of the folder as well.

Importing Trajectory:

1. Inside RobotStudio, select the *Home* tab and then click *Import Geometry* as indicated in Fig. 3
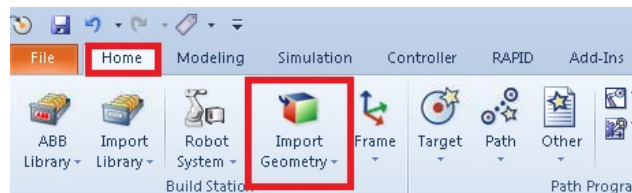

Figure 3: Importing trajectory points

2. A window will appear. Browse for *sqrpositions.wrl* - you will need to look in the *Systems/System/HOME* folder. Select the .wrl file by double clicking on it.

3. Verify you imported *sqrpositions.wrl* by seeing it appear on the left hand side of your screen under the *Layout* subtab as shown in Fig. 4.

Whenever you modify the trajectory file, you will need to delete the original *sqrpositions.wrl* and reimport the file. To delete, simply right mouse-click the component you wish to remove and select *Delete*.

Simulating:

1. Select the *Simulation* tab then click *Play* as shown in Fig. 5.

There are several ways to get a better view of the robot during the simulation. To modify the speed of the simulation, click the *Simulation Control Options* (bottom right arrow next to Simulation Control in 5). A
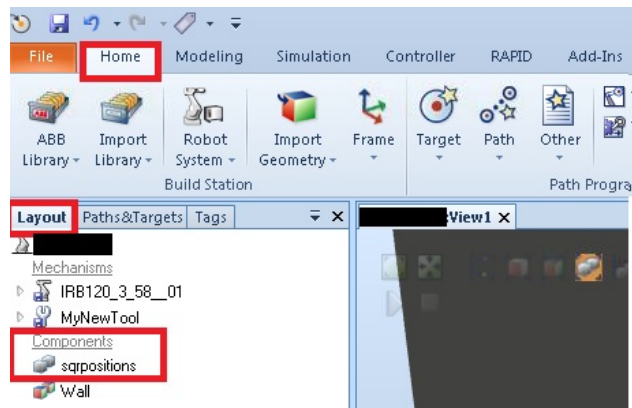
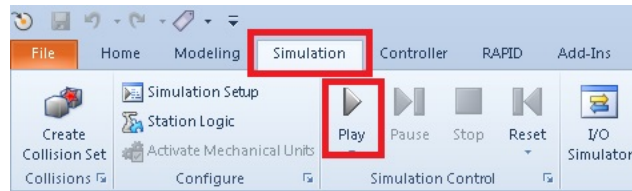Figure 4: Confirm *sqrpositions.wrl* was successfully imported.

Figure 5: Run your simulation

window will appear that allows you to adjust the simulation speed and time step. It is recommended to use a slow simulation speed (10%) and a short timestep (12 ms) to see the robot behavior more clearly.

RobotStudio Viewing Shortcuts:

- **Ctrl** - translate the point of view, can pan left or right

- **Ctrl + Shift** - rotate the point of view

- **'View All' Button** - located at top left side of the workcell, returns point of view to center of screen