Task 0 - Pollinator Bee

Problem Statement

Detecting WhyCon markers

From the tutorials, you have learned

- Basics of V-REP: scene, child-script, objects.
- Basics of ROS: creating workspace, creating package, launch file, writing a subscriber.
- WhyCon marker: topics which the package subscribes and publishes.

Scene Description

Load the given scene *task0_pb.ttt* in V-REP simulator. The scene looks as shown in Figure 1:

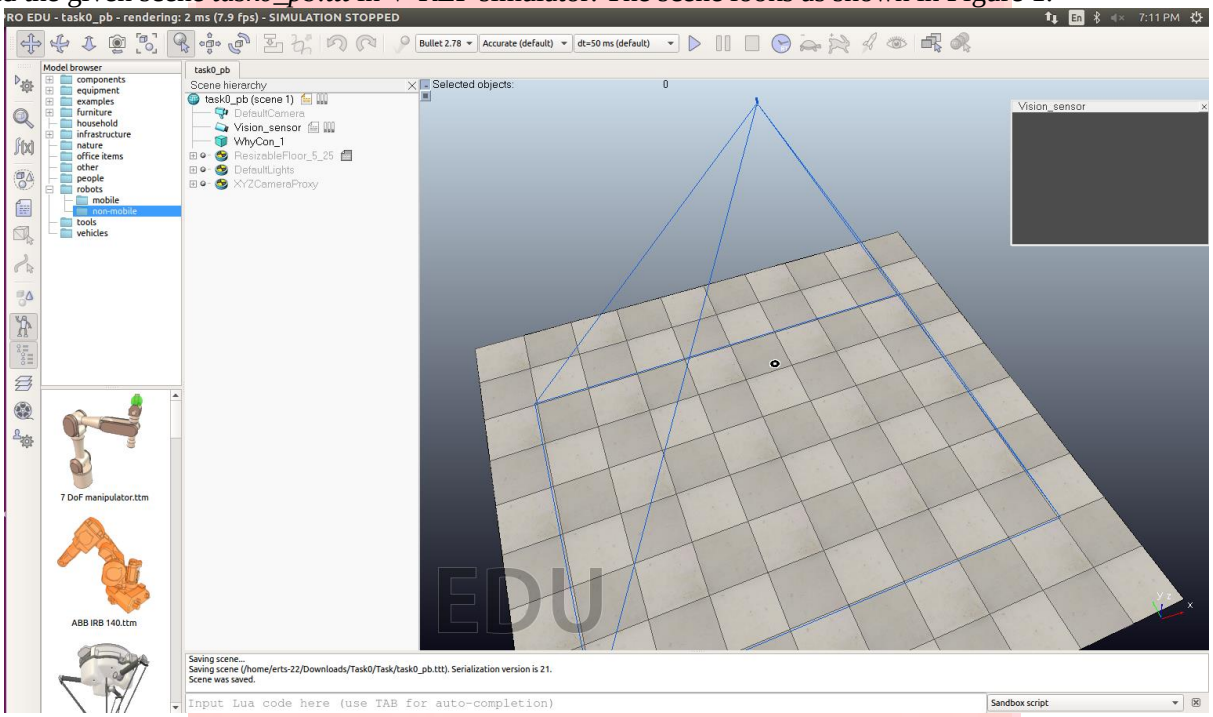

Figure 1: task0_pb.ttt

Following are the various objects in the scene:

WhyCon: There is one WhyCon marker with the name WhyCon_1.
Vision_sensor: This gives an image within the blue region with a resolution 640 x 480.
The image of the vision sensor is visible in the floating view window named Vision_sensor present in the side of the scene on running the simulation.

Problem Statement

- Fetch WhyCon marker coordinates of the static marker placed in the V-REP scene by subscribing to marker's corresponding topics.

Procedure

1. Load ***task0_pb.ttt*** in V-REP simulator after launching *roscore* in a terminal. Follow the Understanding World.pdf to learn about the V-REP scene.
2. Clone the WhyCon package in your **'src'** folder. Follow the Understanding WhyCon.pdf in the tutorials folder for better understanding on the WhyCon package.
3. Using the ***remap*** tag, remap the required topics within the ***'whycon.launch'*** file and save your work. Run the simulator and then launch the 'whycon.launch' file using the command *'roslaunch whycon whycon.launch'*. This launch file must ideally run required nodes in the WhyCon package to detect markers in the image published by vision sensor in the V-REP and should output the image of the detected WhyCon marker as shown in Figure 2.

Figure 2: WhyCon Output

Points to remember

- Simulation setting should not be changed
  - Dynamics engine : Bullet 2.78
  - Dynamics settings : Accurate (default)
  - Simulation time step : dt = 50 ms (default)
- You are not supposed to change any of the templates
- **Make sure you remap the topics properly to detect markers in the WhyCon launch file**
- Run "*rostopic type /topic_name*" to see what the message type of the corresponding topic is
- Run "*rosmsg show topic_type"* to see what the message structure is
- Run "*rqt_graph*" in a separate terminal to check your topic and node relations. It should look something like in figure 4.
- You cannot run two nodes with the same name. Look into the group tag in launch file to understand how you can run two nodes with same name.

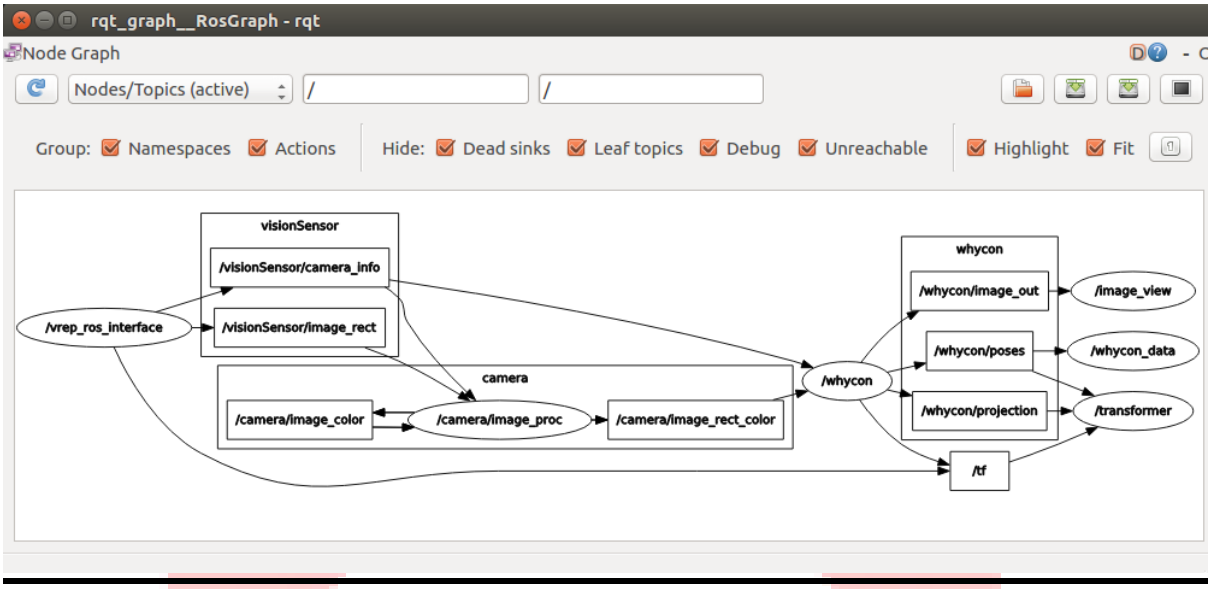

Figure 4: rqt_graph

Submission Instructions:

Follow the instructions below to submit your Task.

1. **Bag File:**
   a. First launch your WhyCon detection file by running the following command **after loading your V-REP scene**:

      roslaunch whycon whycon.launch

   b. Next run the rosbag command to record your work. The following command records your work for 5 seconds and saves it with a .bag extension in the directory from where you executed the command:

      rosbag record /whycon/poses --duration=5s --chunksize=10

   c. Next step is to compress the .bag file that is created before you can upload it. Run:

      rosbag compress –j ~file_name.bag

   d. This will compress your bag file and the size should now be below 5mb approximately.

   e. Rename the compressed bag file as **<team_id>.bag**

2. **Image File:**
   a. Take a screenshot of showing the WhyCon marker detection.
   b. Rename the image file as **<team_id>.png**

Store the files mentioned above in a folder and compress the folder into .zip file and rename the folder as <team_id>.

NOTE: You must upload all of the following: (i) bag file and (ii) screenshot of WhyCon marker detected. Please place all these files inside a .zip file before uploading.

Please follow the naming convention strictly as specified in each step. Failure to do so may lead to repercussions.

Your final .zip output must be of the following structure:

<team_id>.zip

<team_id> *[folder]*

- **<team_id>.bag**
- **<team_id>.png**

Instructions for uploading the folder will be provided on portal

Good Luck!!!