

Task 1.1 - Pollinator Bee

Problem Statement

Position Hold of the drone within V-REP

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- The drone should hold its position in the given simulation scene at the given point **[-5.63, -5.63, 30]** using the PID control algorithm. A maximum error of 0.2 is tolerated in both the x and y axis and an error of 1.5 is tolerated in the z axis.
- Answer the questions given in [Think and Answer.docx](#) in the analysis folder

Procedure

- Load *Scene.ttt* in V-REP simulator after launching *roscore* in a terminal.
- Clone the **Pollinator Bee** package in your 'src' folder using the following:
`git clone https://github.com/badrobot15/pollinator_bee.git`
- Write a PID script after going through the tutorials provided to you. A boiler plate code is provided to you in the scripts folder titled *task_1.1.py*. Launch your code and the drone must hold position at the point **[-5.63, -5.63, 30]** as per the WhyCon coordinate system.

From the tutorials, you have learned

- Basics of PID
- Pluto Drone and the PlutoMsg type

Scene Description

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

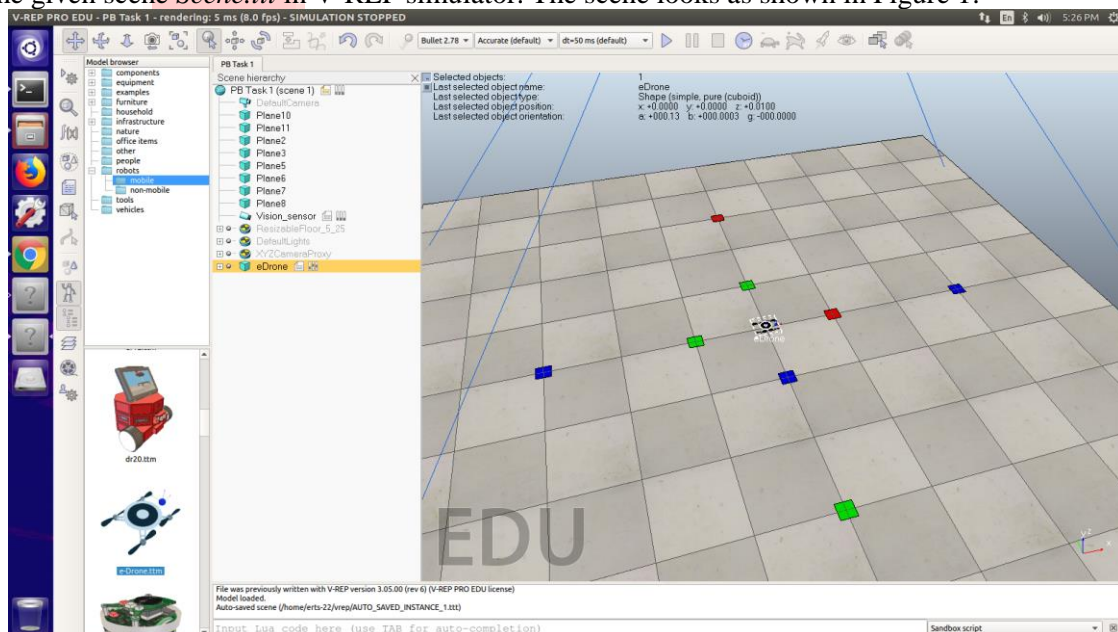


Figure 1: Scene.ttt

Following are the various objects in the scene:

Pluto Drone: There is one Pluto Drone model with the name eDrone.

Vision_sensor: This gives an image within the platform area within the blue lines 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

Points to remember

- Simulation settings should not be changed
 - ◆ Dynamics engine : Bullet 2.78
 - ◆ Dynamics settings : Accurate (default)
 - ◆ Simulation time step : dt = 50 ms (default)
- Please do not change any of the templates
- **Create a PID script or edit the given example script by adding your PID code. Finally, run it to control the drone and make it hover at point [-5.63, -5.63, 30]**
- **Most of the code in the task_1.1.py is already written. Read the comments within the script and fill out the empty functions. Study the [Understanding PID.pdf](#) tutorial in order to understand how to implement PID.**
- Run “`rostopic type /topic_name`” to see what the message type of the corresponding topic is
- Run “`rosmmsg show topic_type`” to see what the message structure is

Submission Instructions:

Follow the instructions below to submit your Task.

1. Bag File:

- a. First launch your Pollinator Bee package by running the following command **after loading your V-REP scene:**

```
roslaunch pollinator_bee pollinator_bee.launch
```

Make sure your launch file has a node of task_1.1.py. Comment out task_1.2.py node.

- b. Next run the rosbag command to record your work. The following command records your work for 15 seconds and saves it with a .bag extension in the directory from where you executed the command:

```
rosbag record /whycon/poses /whycon/image_out --duration=15s --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. Rename the compressed bag file as **<team_id>.bag**

2. Python Code:

- You must submit your PID script that you developed.
- Rename the python script as **<team_id>.py**

3. Think and Answer:

- Submit the Think and Answer in **PDF** format only.
- Rename it as **<team_id>.pdf**

4. Video Submission:

- Using screen record, record video of the drone performing the task.
- Name the video as PB_eYRC#<team_id>
- Upload instructions will be provided on the portal.

Store the files mentioned above in a folder and compress the folder into .zip file and rename the folder as **<team_id>**. Do not place the video within the .zip folder. You must upload that separately on YouTube. Instructions for uploading this video is given on the portal.

NOTE: You must upload all of the following: (i) bag file and (ii) Python code and (iii) Think and Answer.pdf. Please place all these files inside a .zip file before uploading. You must also upload the video to YouTube.

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>.py**
- **<team_id>.pdf**

Instructions for uploading the folder will be provided on portal

“Float like a butterfly and sting like a bee”

- Muhammad Ali

Good Luck!!!