Task 2 – Real-time Emulation

From previous tasks you have learned:

- WhyCon marker detection
- ArUco marker detection
- Transforming V-REP world coordinates to WhyCon coordinates.

Scene Description:

Load the given scene task2_hb.ttt in V-REP simulator. The scene looks as shown in Figure 1:

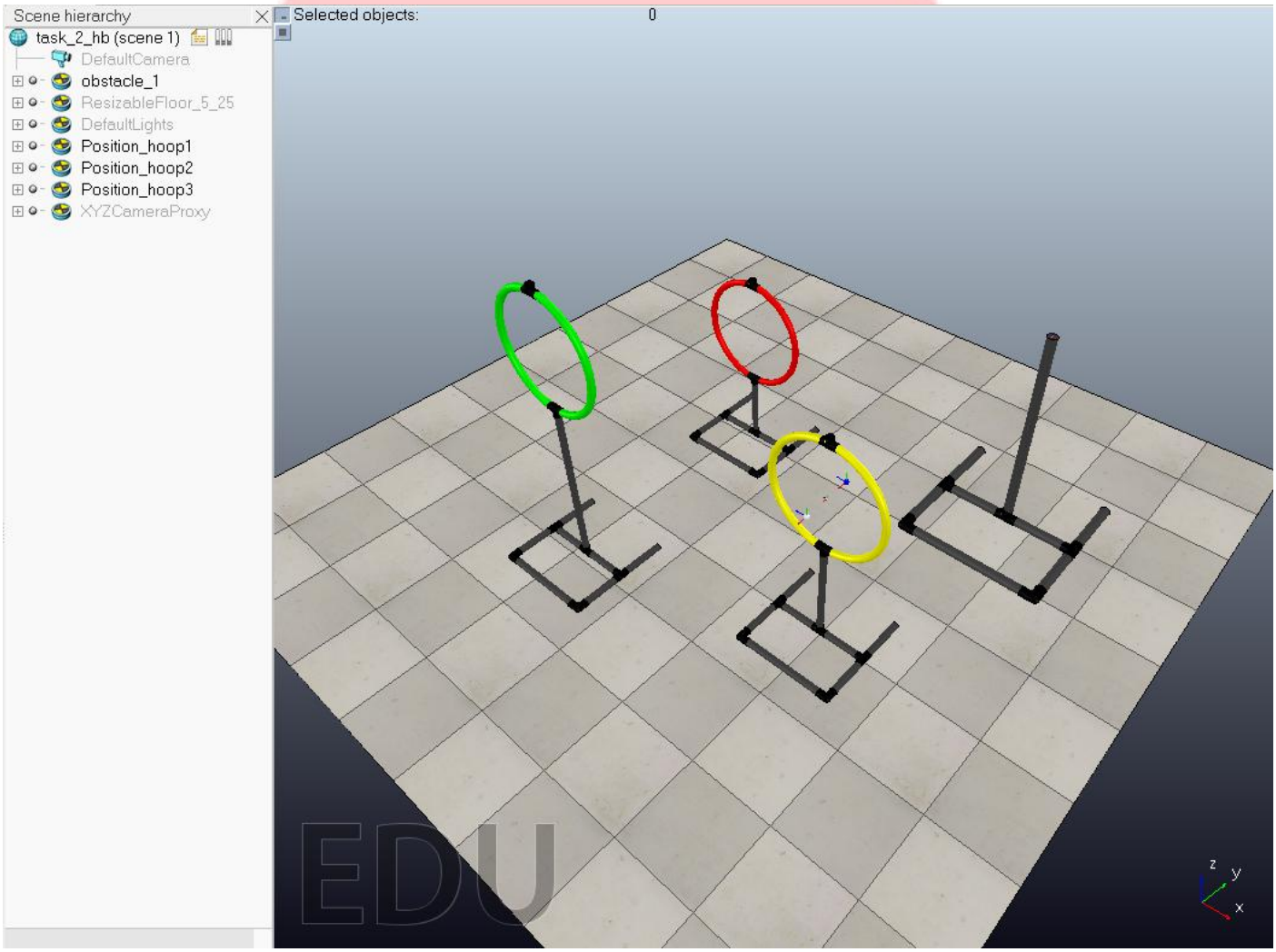

Figure 1 : task_2_hb.ttt

Following are the various objects in the scene:

- Obstacle_1 : This represents the obstacle similar to a non-food tree which you have made as per the instruction given in rulebook.
- Position_hoop : Dummies named Position_hoop_1 to Position_hoop_3 represent the food trees : Mango (yellow), Sal (Green), Cashew (Red)
- Emulation_script : This child script must be completed to emulate food and non-food trees in V-REP. Please follow the instructions and hints provided in the script template.

Problem Statement:

Emulate Food and Non-Food trees in V-REP based on the given configuration in table 1

Tree	Position	Orientation
Sal tree	I-B	5B
Cashew tree	IV-E	6A
Non-food tree 1	V-C	-

Procedure:

1. Copy *emulation_vrep.launch* into the **launch** folder of **hungry_bird** package.
2. Connect the camera to the PC. Check the device and make corresponding changes to *emulation_vrep.launch.*
3. Complete the child script of *emulation_script* dummy to emulate the trees in V-REP.
4. Run the launch file using the following command:

```
>> roslaunch hungry_bird emulation_vrep.launch
```

5. Run the simulation and emulate all the trees in V-REP. Use the help of the topic /input_key (go through tutorials.pdf)to set the position and orientation of the Trees using input from keyboard.
6. Ideally after the emulation, the image from the overhead camera and the top view of the V-REP will be very similar.

Points to remember:

- Make sure you go through the document *tutorials.pdf* online on this link to learn how to publish a topic on pressing key from the keyboard and how to change the orientation of the hoops.

Rules:

- The following simulation settings are default and **should not be changed.**
  - Dynamics engine: Bullet 2.78
  - Dynamics settings : Accurate (default)
  - Simulation set
- You should **not** change the positions and orientations of the Trees manually in this task.
- All changes in the position and orientations of the Trees should happen via the script at runtime.

Submission Instructions:

After completion, follow the instructions below to submit your task:

- Rename the screenshot you captured to <team_ID>_*task_2_hb.jpg* I.e. if your team ID is 105, then rename the file to *105_task_2_hb.jpg*.
- Rename the scene file *task_2_hb.ttt* to <team_ID>_*task_2_hb.ttt* I.e. if your team ID is 105, then rename the file to *105_task_2_hb.ttt* (Note: It should contain the Lua script you wrote).
- Compress these two files in a single .zip archive, the output should be <team_ID>_*task_2_hb.zip*.
- Please follow the naming convention strictly as specified in each step.
- Upload this .zip file to the folder.

Good luck!