

Experiment: 7

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<u>Aim:</u> Understanding robotics developmentplatform environment to model, program and simulate robots.

Tools Used: Coppeliasim

Theory:

The robotics simulator CoppeliaSim (formerly V-REP), with integrated development environment, is based on a distributed control architecture: each object/model can be individually controlled via an embedded script, a plugin, a ROS node, a remote API client, or a custom solution. This makes

Coppeliasim very versatile and ideal for multi-robotapplications. Controllers can be written in C/C++, Python, Java, Lua, Matlab or Octave.



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Procedure:

- 1. Go to add and add primitive shape ie. Sphere of (x=0.2m)
- 2. Click on sphere and go in common and make object model, collidable, measurable, dectable.
- 3. Go on position shifting and click on translation and make (z=0.02m) and rename as bubble rob.

ADDING PROXIMITY SENSOR

- 1. Click on position on left side.
- 2. Make x=0.1,y=0,z=0.12.
- 3. Click on rotate and go to orientation.
- 4. Make alpha=0,beta=90,gamma=90.
- 5. Go on proximity sensor and click on volume parameters
- 6. Set offset=0.05,range=0.15,angle=30.
- 7. Connect bubble bot and proximity sensor.

ADDING NEW SCENE

- 1. Now add new primitive shape cylinder.
- 2. Rename it bubble rob left wheel.
- 3. Go to position shifting (x=0.05,y=0.1,z=0.04).
- 4. Rotate alpha=-90.
- 5. On common make it model, collidable, measurable, detectable.
- 6. Copy and paste it and rename as bubble rob right wheel.
- 7. Make position of this wheel (y=-0.1)
- 8. Copy and paste 2 wheels on original scene.

ADDING JOINTS

- 1. Add joint revolute type.
- 2. Double click and make it model.
- 3. Select joint and left wheel.
- 4. Go to position and click apply.
- 5. Go to orientation and click apply.
- 6. Add joint for right wheel also
- 7. Go on left motor and click on dynamic properties.
- 8. Make (velocity=0,torque=2.5) and lock.
- 9. Select left wheel and select left motor.
- 10. Edit and make last seleced as parent.

STEPS TO START WITH COPPELIASIM:-



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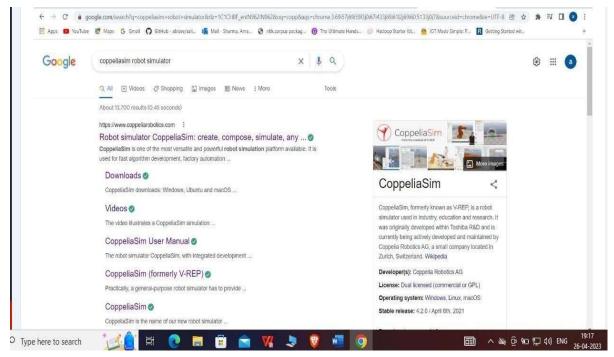


Fig.1: Search Coppeliasim

STEP 2 -:



Fig.2: Open Official Site



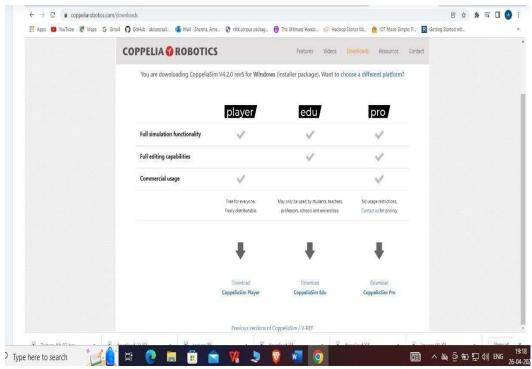


Fig.3: Download

STEP 4 -:

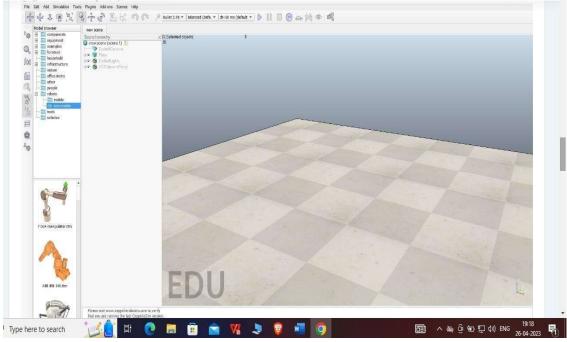


Fig.4: Open Scene 1



STEP 5 -:

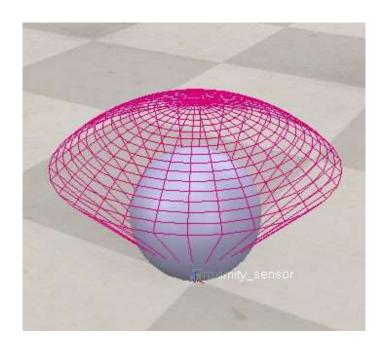


Fig.5: Scene 2

STEP 6 -:

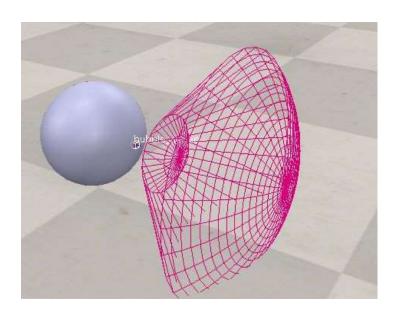


Fig.6: Final Scene



STEP 7 -:

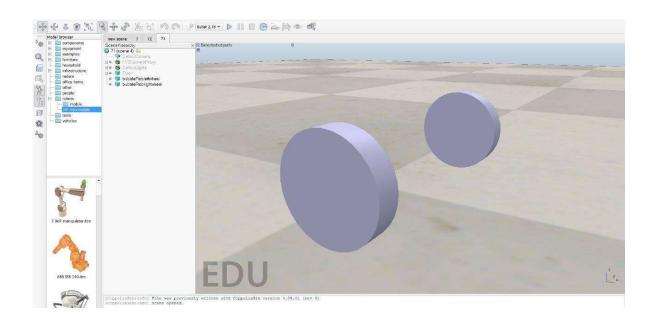


Fig.7: Adding wheels

STEP 8 -:



Fig.8: Adding wheels on main scene



STEP 9 -:

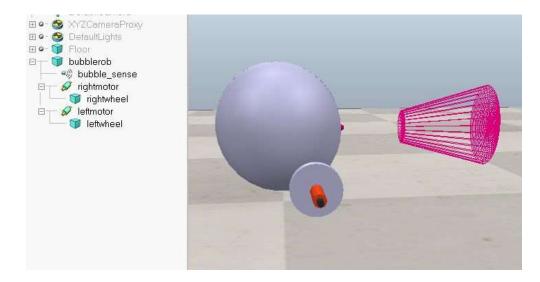


Fig.9: Motors to the wheel

STEP 8 -:

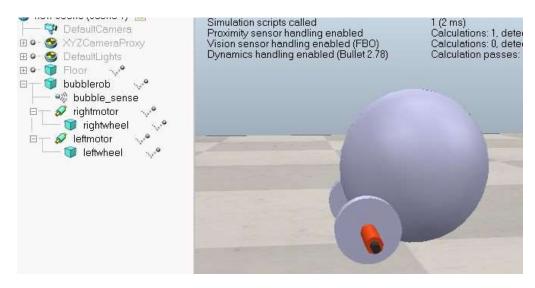


Fig.10: Inverted bubblerob



Evaluation Grid (To be filled by Faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (task implementation and result evaluation)		12
2.	Viva-Voce		10
3.	Worksheet Submission (Record)		8
	Signature of Faculty (with Date):	Total Marks Obtained:	30