

Dairy Bike: Task 3

task-3

saurabhp e-Yantra Staff

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TASK 3

Welcome everyone to Task3 of Dairy Bike!

Checklist to proceed further into Task 3:

- Make sure that the hierarchy of elements (FrontWheel, RearWheel, ReactionWheel) given in Task 2 is maintained.
- The chassis part of the body should be the main parent and all the elements of the Dairy Bike will be under the hierarchy of that main parent.
- Use solid objects to make the package storage area instead of planes.
- If your arm is falling off the DB, then add a force sensor as a child to the chassis and make the arm as the child of that force sensor.
- The arm should not collide into the reaction wheel or any other part of the DB.
- You should not make the packages (Milk, Curd, Cheese*) as part of the hierarchy of the main parent of the DB.
- There should be a proper hierarchy for steering, allowing the Dairy Bike to change the direction of motion without any hindrance.
- Make sure your DB is not overweight, you need to reduce the weight of some components except the Front wheel, Rear wheel and Reaction wheel.
- Reaction wheel should not be too low on DB, as it will require very high torque to balance if placed low.

Note: If the checklist mentioned above is not followed, your Task 3 won't get evaluated.

Steps to export your Dairy Bike design into model:

Now that you have learned various software and designed your own Dairy Bike, you will now do some cool experiments with it here!

Let's begin with some Control experiments:

1. Dairy Bike Balancing

- An awesome fighter jet is worthless without a great pilot. Similarly, your DB (designed in Task 2.1) is useless without the controller to balance it.
- This controller will be responsible for providing counter torque using the reaction wheel

you did in Task 1.3.

- **Here** is the scene file for this sub-task.

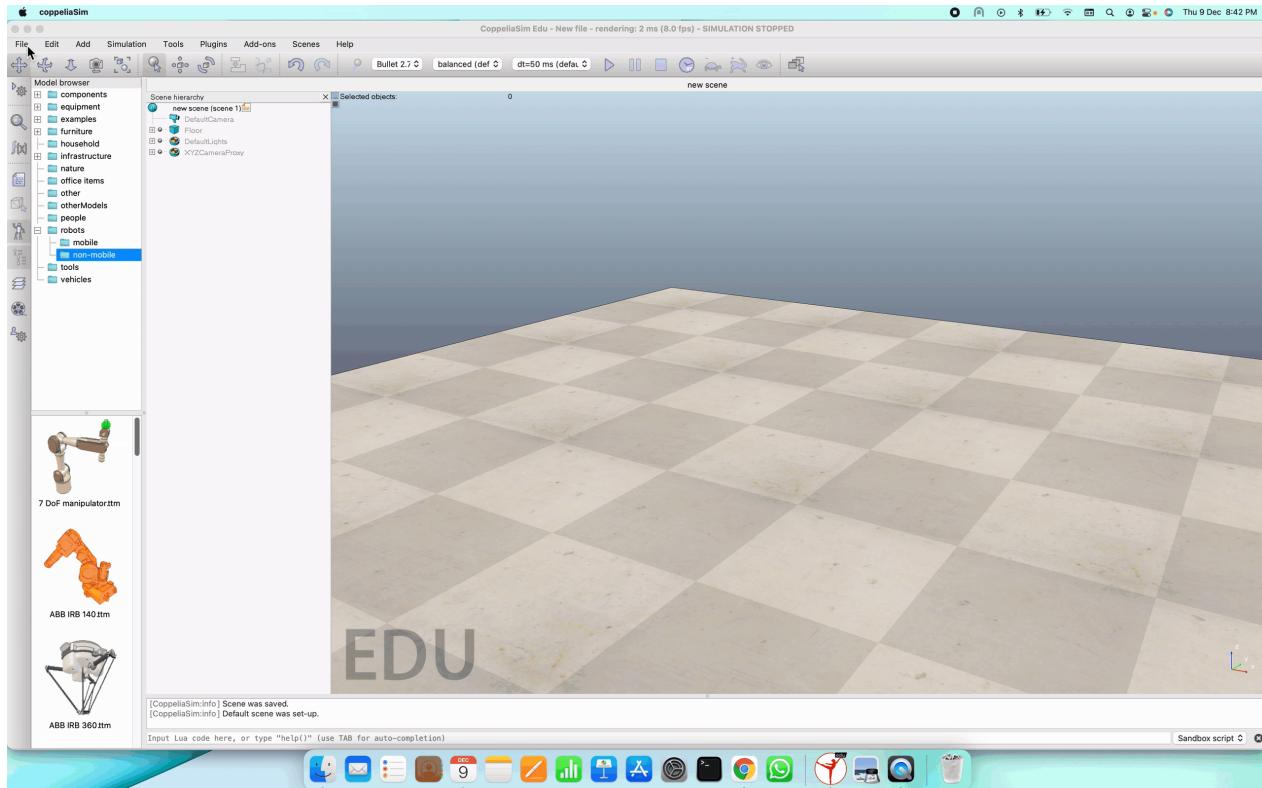
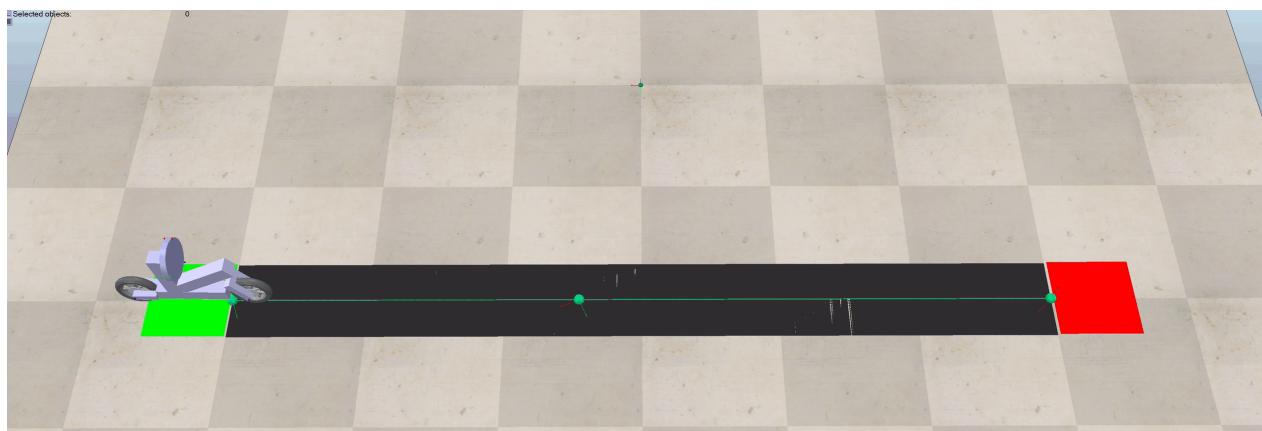


Fig 1:

2. DB Steering and Linear Motion

- Now that you have successfully balanced your DB on its wheels, let's take it a step further. In this sub-task you will be steering the DB and along with that make the DB move in linear motion.
- **Here** is the scene file for this sub-task.
- The steering mechanism you have designed will help you guide the DB through different terrains in future.
- Now, first import your DB model into the .ttt file of this sub-task.
- You should use the black strip as a guideway while traversing .
- You are required to make the DB travel from green patch to red patch along the strip.



3. DB figure of 8/ ∞ travel:

Congrats for successfully completing the linear motion and steering!

Let's now do a bit more complicated task, here you will have to make the DB travel on a 8 or ∞ shaped path.

- **Here** is the scene file for this sub-task.
- Now, first import your DB model into the .ttt file of this sub-task.
- You should use the black strip as a guideway while traversing .
- You are required to make the DB travel from green patch(start point) to red patch(end point) along the strip and pass all the checkpoints sequentially.

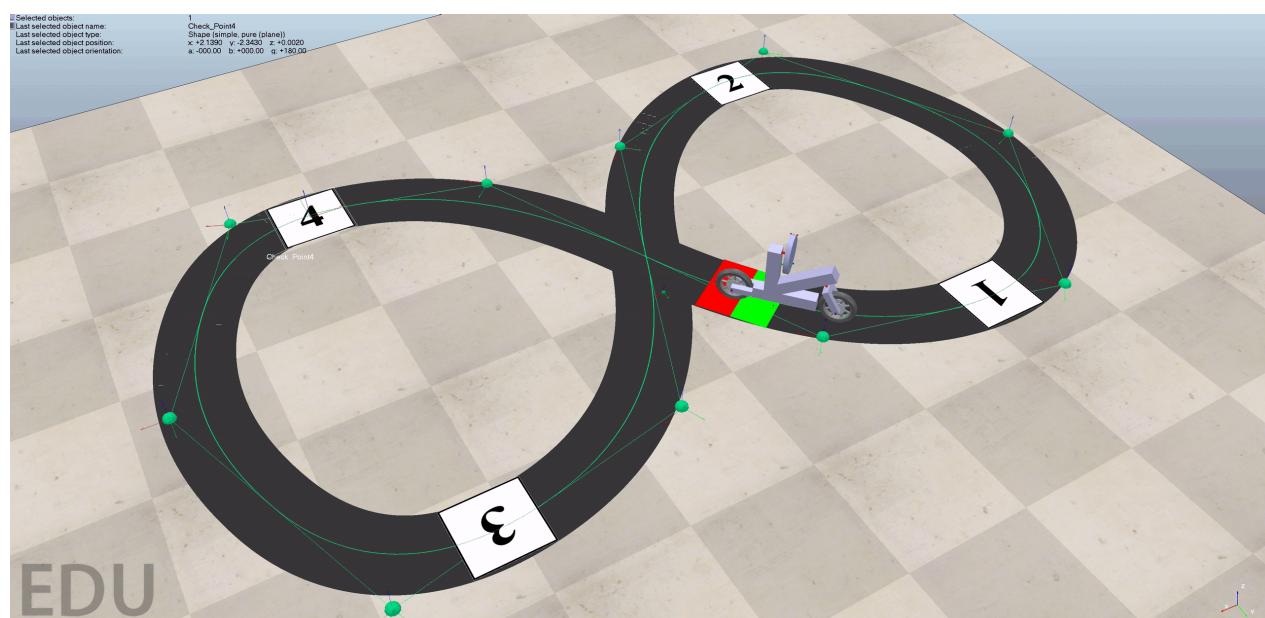


Fig 3:

4. DB on Straight Bridge

- Let's take up another challenge!!
- **Here** is the scene file for this sub-task.

- Now, first import your DB model into the .ttt file of this sub-task.
- You should use the black strip as a guideway while traversing .
- You are required to make the DB travel from green patch(start point) to red patch(end point) over the bridge and along the black strip.

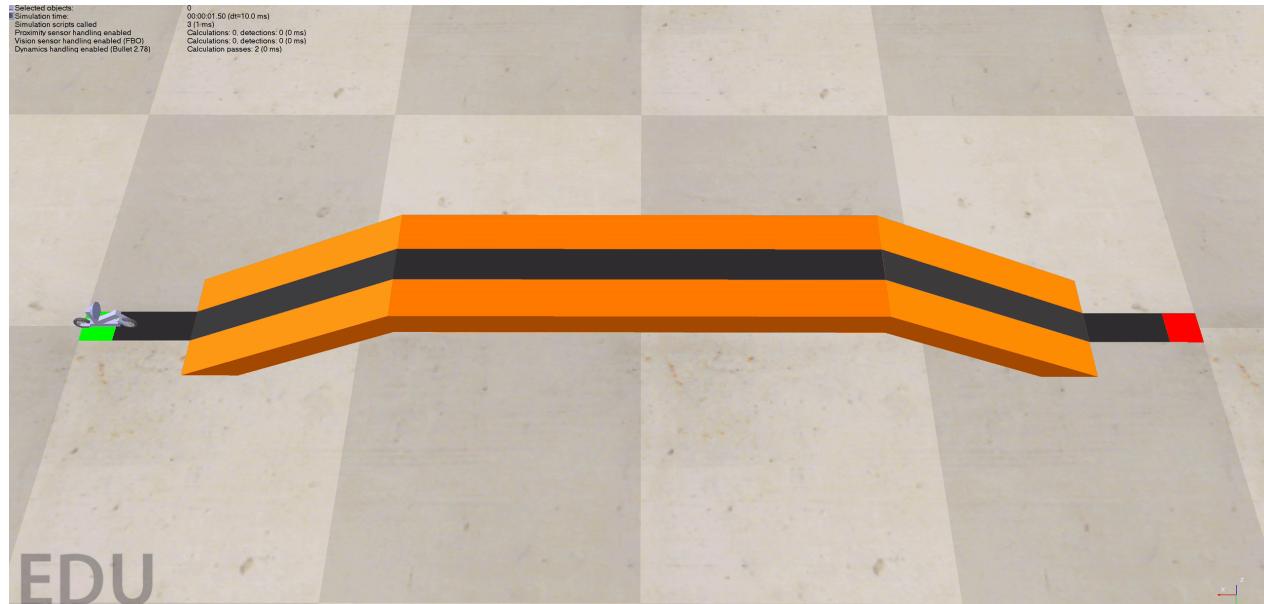


Fig 4:

5. DB on Curved Bridge

- Let's go a step further!!
- Here you'll make your DB travel a curved bridge which is also inclined.
- [Here](#) is the scene file for this sub-task.
- Now, first import your DB model into the .ttt file of this sub-task.
- You should use the black strip as a guideway while traversing .
- You are required to make the DB travel from green patch(start point) to red patch(end point) over the bridge and along the black strip.

