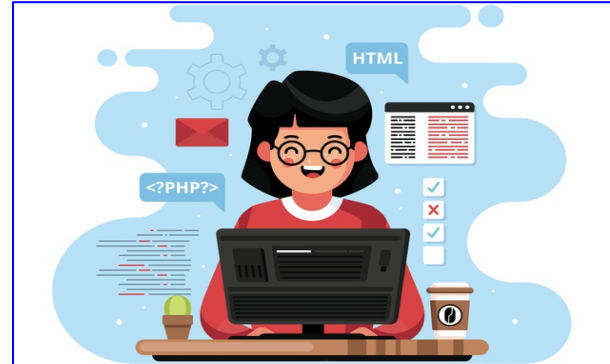


## Ramp Follower Robot- III



### What is our GOAL for this CLASS?

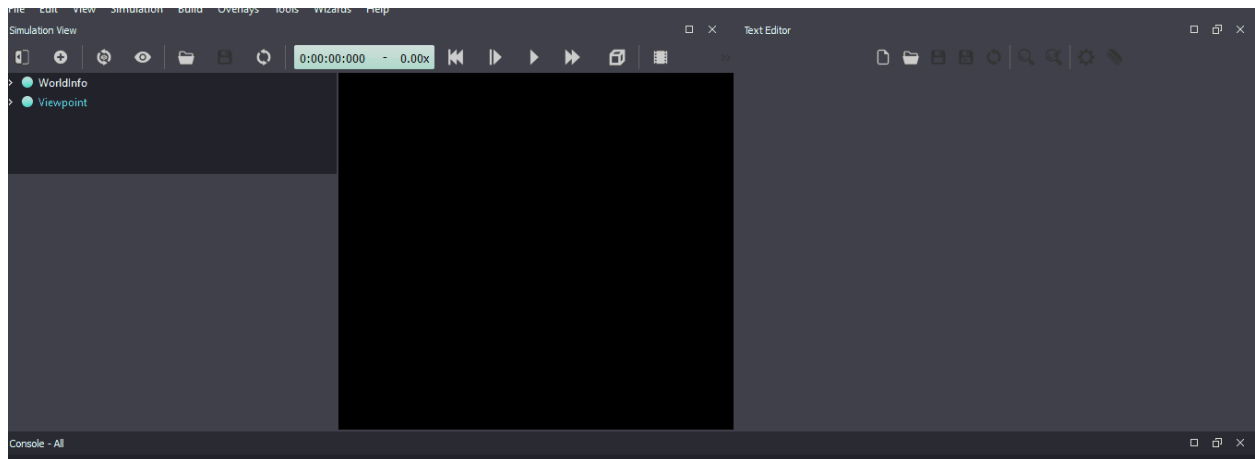
In this class, we designed the face of the follower Robot. We installed distance sensors in the eyes of Robot to track the distance of the Follower. We designed a happy face for the Robot.

### What did we ACHIEVE in the class TODAY?

- We designed the left and right eye.
- We installed Distance Sensors.
- We designed the happy face of the Robot.

### How did we DO the activities?

1. Open the Follower Ramp file.





<https://s3-whjr-curriculum-uploads.whjr.online/efe2e800-1c83-4d97-bc8d-14fd8a3288cf.gif>

## 2. Teams related to Webots:

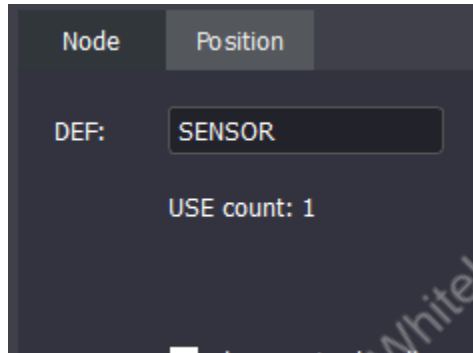
Distance Sensors: Distance sensors sense distance from the object i.e Ramp.

## 3. Procedure for Right Eye

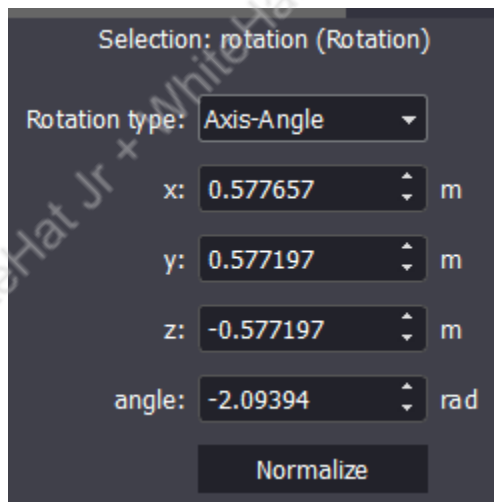
1. Click on **HingeJoint**(Last Hingejoint from the Bottom)
2. Click on +
3. Select **Base nodes**
4. Click **Base nodes drop down** 
  - a. Select **DistanceSensor**
  - b. Click **Add**
  - c. **Parameters**
    - i. Set **translation** 0.042, 0.02, 0.063
    - ii. Set **rotation** 0, 0, -1, -0.499
    - iii. Set name " ds0"

 name "ds0"

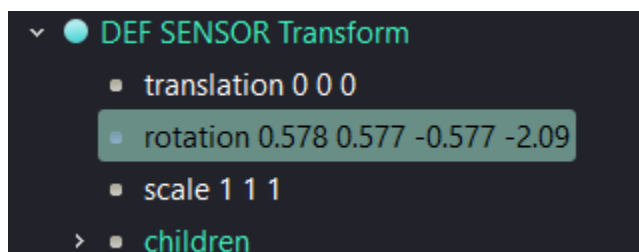
- d. Double Click on **children**
- Select **Transform** under Base nodes
  - Click **Add**
  - Write the name of DEF function "**SENSOR**"



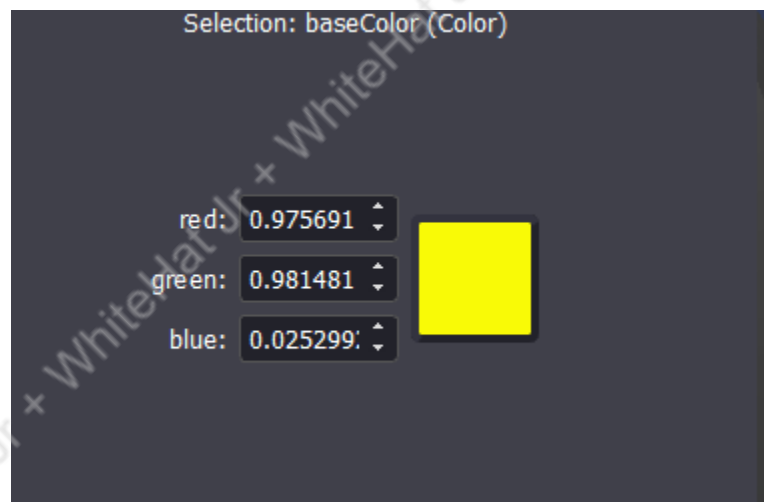
- iv. Set **rotation** as per below values



- v. Double Click on **children** under DEF SENSOR TRANSFORM



- vi. **Select Shape under** Base nodes
- vii. Click **Add**
- viii. Double click on drop down of **Shape**
  - 1. Double Click on **Appearance**
  - 2. **Select PBR Appearance**
  - 3. **Click Add**
  - 4. **Set base color 0.97 , 0.98, 0.025(Yellow color)**

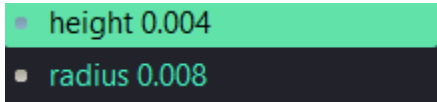


*Note : Color can be selected from ColourBox too as per student wish.If not then use the mentioned one.*

- 5. **Set Roughness 1**
- 6. **Set metalness 0**
- 7. Under **Appearance** there is **Geometry Null**. Double  
Click on **geometry Null**
- 8. Select **Cylinder under Base nodes**
- 9. Click **Add**

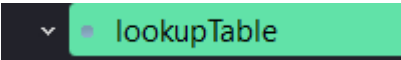
a. Set Height 0.004

b. Set Radius 0.008

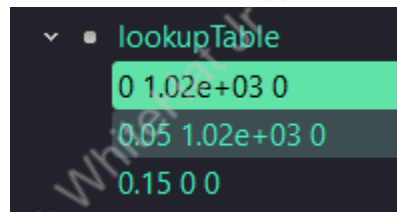


```
height 0.004
radius 0.008
```

10. Go to lookup Table

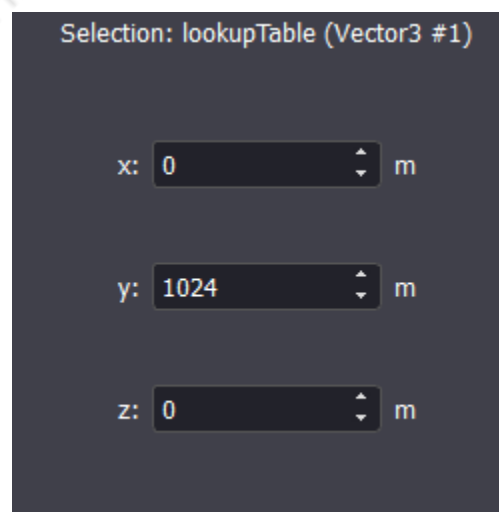


Now we want to show rays from a distance sensor while moving. For that we need to fix positional values. You will see two options under the lookup table but we need three different x,y,z values for three positions. Click on 1st and enter the following values.



```
lookupTable
0 1.02e+03 0
0.05 1.02e+03 0
0.15 0 0
```

1st Value:



Selection: lookupTable (Vector3 #1)

x: 0 m

y: 1024 m

z: 0 m

2nd Value:

```
lookupTable  
0 1.02e+03 0  
0.05 1.02e+03 0  
0.15 0 0
```

Selection: lookupTable (Vector3 #2)

x:  m

y:  m

z:  m

3rd Value:

If the third value is not there you can copy the second row and just click on paste.

Selection: lookupTable (Vector3 #3)

x:  m

y:  m

z:  m

11. Set **number of rays** : 2

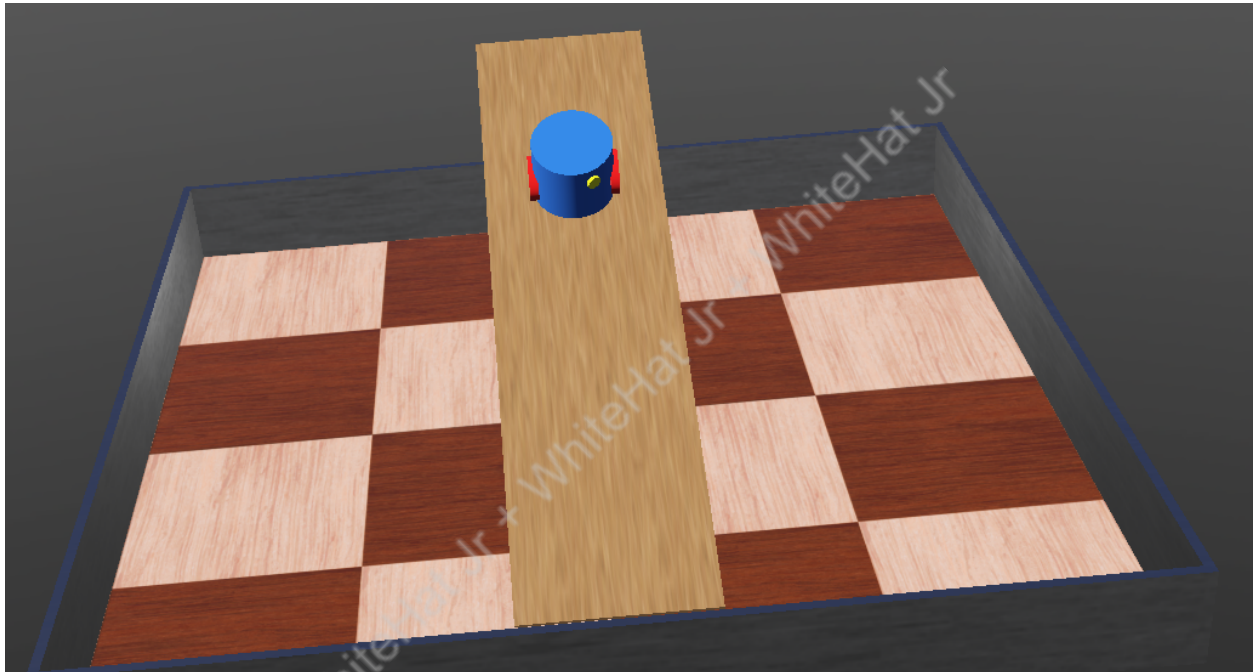
■ numberOfRays 2

12. Set **Aperture**

13. Save the simulation.



You will see a yellow eye on the right side. Distance sensor is used in Robot Eye's.



#### 4. Procedure for left Eye

Let's change some translational and Rotational settings to set the eye and distance sensor

1. Go to the Distance sensor ds1
2. Click on Drop Down Distance Sensor ds1

Note: You will see right eye, but as this is left eye we need to change the name.

3. Go to the name option and write "ds1"

name "ds1"

- Set translation settings:

Selection: translation (Vector3)

x: 0.042 m

y: -0.02 m

z: 0.063 m

- Set Rotation

Selection: rotation (Rotation)

Rotation type: Axis-Angle

x: 0 m

y: 0 m

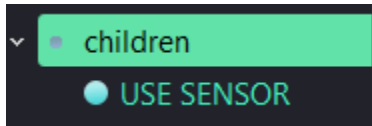
z: 1 m

angle: -0.500795 rad

Normalize

- Double click on **children** under **DistanceSensor ds1**
- Instead of Base nodes we will use pre -defined function which we made while  
 right eye .electS on Use and click on drop down and Select **SENSOR**  
**(Transform)**



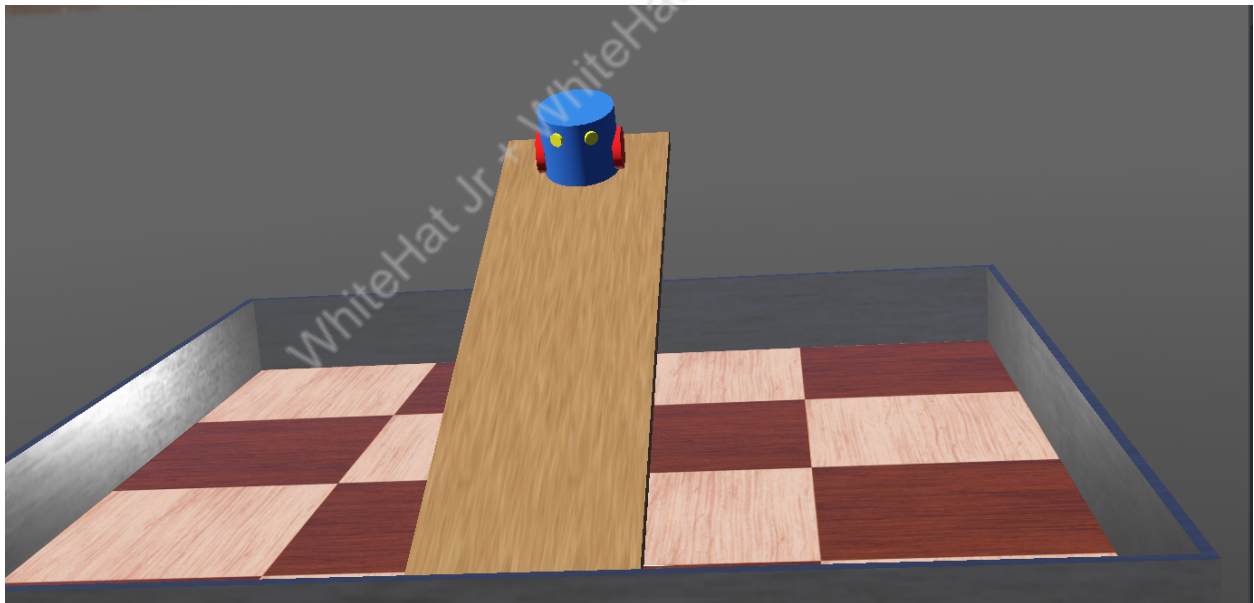


8. Click on **Add**

9. Translational and Rotational Step setting will remain same


- translationStep 0.01
- rotationStep 0.262

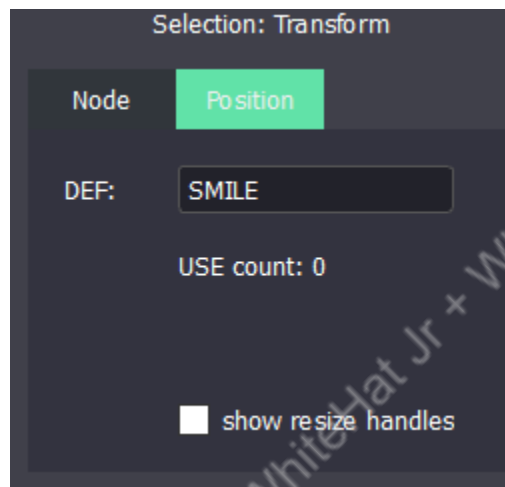
Save the simulation.



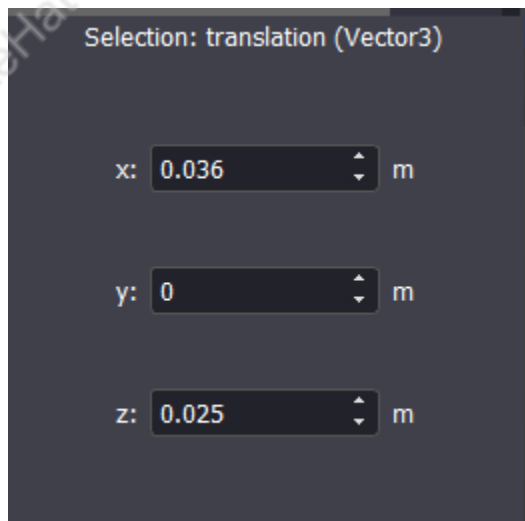
## 5. Procedure for Smile

1. Click on **DistanceSensor ds1**(Last **DistanceSensor ds1** from the Bottom)
2. Click on +

3. Select **Base nodes**
4. Click **Base nodes drop down** 
  - a. Select **Transform**
  - b. Click **Add**
  - c. Write the name of DEF function SMILE



- i. Set **translation** as per below values



- ii. Select rotation

Selection: rotation (Rotation)

Rotation type: **Axis-Angle**

x: 0.250563 m

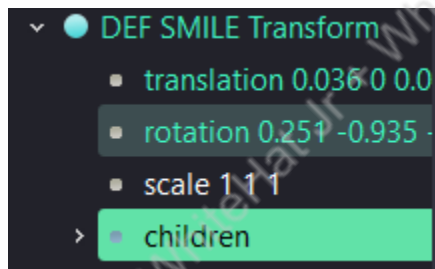
y: -0.935113 m

z: -0.250563 m

angle: 1.63783 rad

**Normalize**

- iii. Double Click on **children** under DEF SMILE TRANSFORM



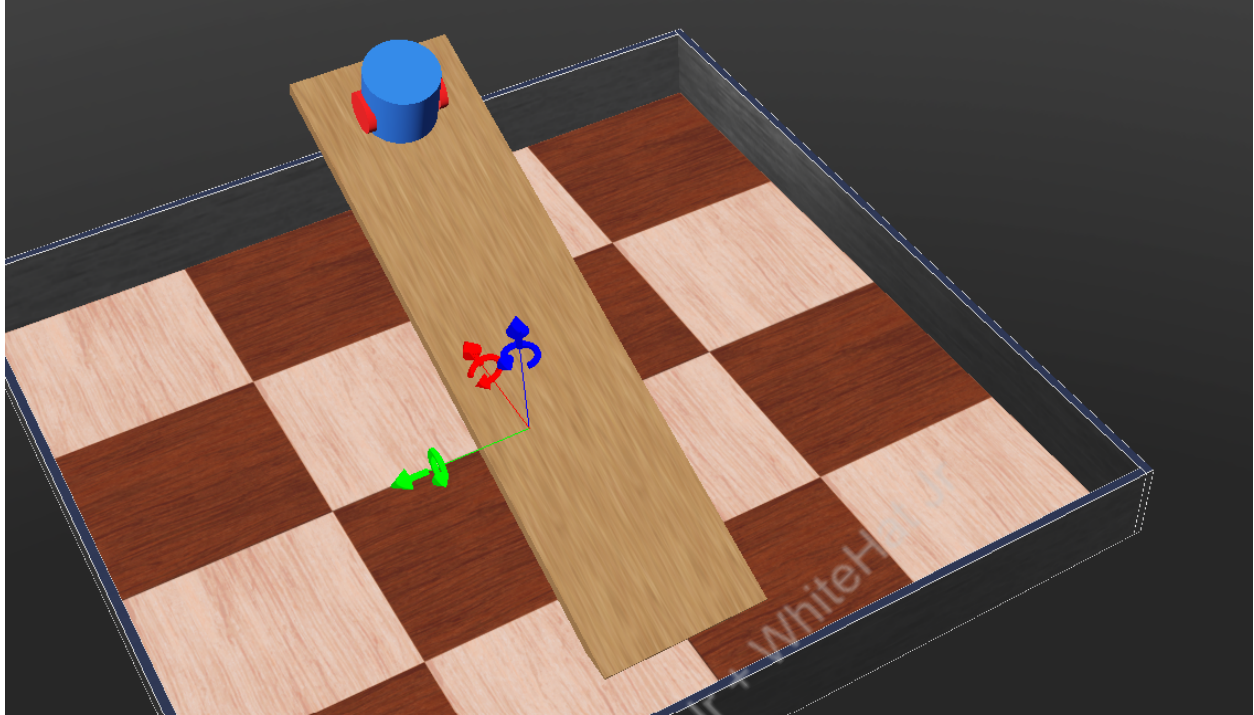
- iv. **Select Shape** under Base nodes
- v. Click **Add**
- vi. Double click on drop down of **Shape**
1. Double Click on **Appearance**
  2. **Select PBR Appearance**
  3. **Click Add**
  4. **Set base color 0.72 , 0.54 0.52(Pink color)**



Note : Color can be selected from ColourBox too as per student wish.If not then use the mentioned one.

5. **Set Roughness 1**
6. **Set metalness 0**
7. Under **Appearance** there is **Geometry Null**. Double Click on **geometry Null**
8. Select **Cylinder** under **Base nodes**
9. Click **Add**
  - a. **Set Height 0.018**
  - b. **Set Radius 0.009**
  - c. **Select subdivision 3**

Save the simulation.



### What's NEXT?

In the **next class**, we will learn to add a controller to work on the movement of Robot.

### Expand Your Knowledge

To know more about **Distance sensors** [click here](#).