PROJECT - 0

ENPM-662

Introduction to Robot modeling

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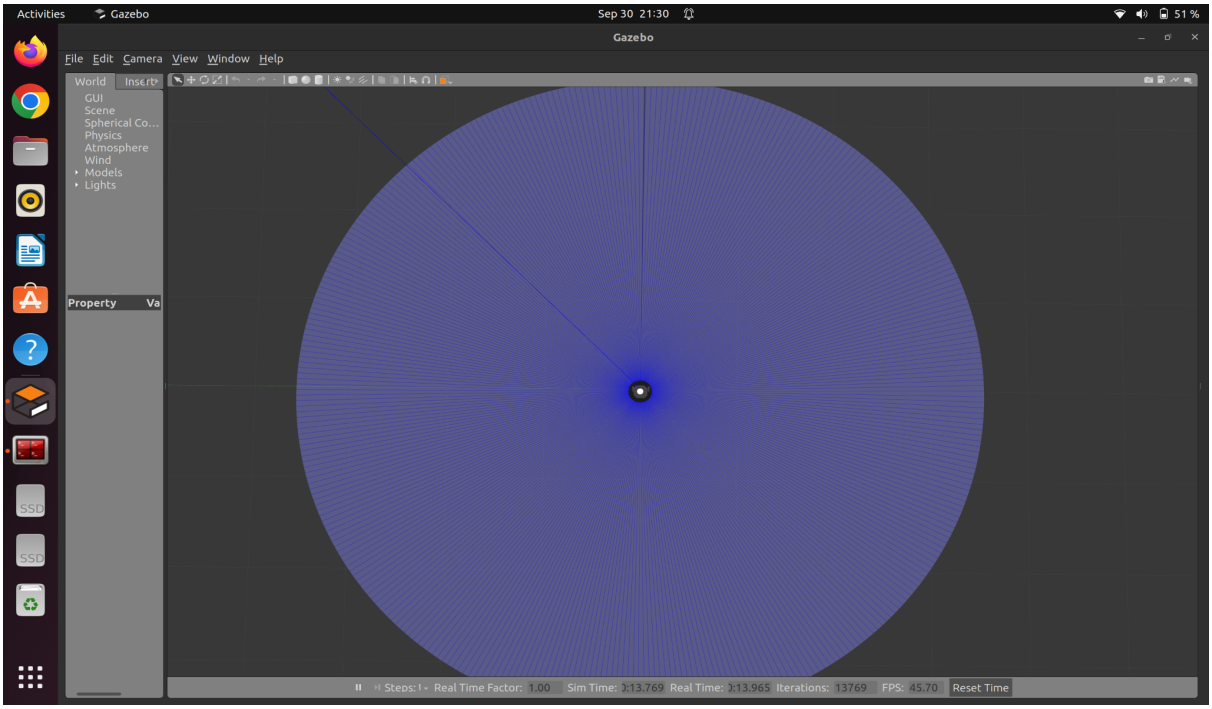
Table of contents

1.Screenshots of software installations:

- Ubuntu,ROS & Git installations

```
dinesh@dinesh:~/project_zero/src$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 22.04.3 LTS
Release:        22.04
Codename:       jammy
dinesh@dinesh:~/project_zero/src$ git --version
git version 2.34.1
dinesh@dinesh:~/project_zero/src$ echo $ROS_DISTRO
humble
dinesh@dinesh:~/project_zero/src$
```

- Gazebo installation :



2.Video recording of the Turtlebot3 using Teleop :

(video-1)
https://drive.google.com/file/d/14N8yhBuxW78fycOoo1CVPkFmcWhcJ1cY/view?usp=sharing

3. Video recording of the Turtlebot3 in Gazebo using open loop controller:

(Video-2)
https://drive.google.com/file/d/1h1P29XL55F268cLSZ2u-xcSL461Rect-/view?usp=sharing

4. Screenshot of the robot pose graph over time:

The screenshot is attached in the video recording of gazebo using open loop controller:(Video2)

https://drive.google.com/file/d/1h1P29XL55F268cLSZ2u-xcSL461Rect-/view?usp=sharing

5.Appendix

```python
#!/usr/bin/env python3

import rclpy
from rclpy.node import Node
from geometry_msgs.msg import Twist

class velpulblisher(Node):

    def __init__(self):
        self.i=0
        super().__init__('tb_openloop')
        self.publisher_ = self.create_publisher(Twist, 'cmd_vel', 10)
        timer_period = 0.5  # second
        self.timer = self.create_timer(timer_period, self.timer_callback)

    def timer_callback(self):

        msg = Twist()
        self.i = self.i+1

        if(self.i<10):
          msg.linear.x=0.5
          self.publisher_.publish(msg)
        elif(self.i>=10 and self.i<=20 ):
          msg.linear.x=0.1
          self.publisher_.publish(msg)
        else:
         msg.linear.x=0.0
         self.publisher_.publish(msg)
        self.get_logger().info('Publishing: "%s"' % msg.linear.x)

def main(args=None):
    rclpy.init(args=args)
    tb_openloop = velpulblisher()
    rclpy.spin(tb_openloop)
    tb_openloop.destroy_node()
    rclpy.shutdown()

if __name__ == '__main__':
    main()
```

6.References:

1. https://docs.ros.org/en/foxy/Tutorials/Beginner-Client-Libraries/Writing-A-Simple-Py-Publisher-And-Subscriber.html
2. https://www.youtube.com/watch?v=Yy4OgGwEAj8