

## AUE-893 Autonomy: Science and Systems

**Repository:** <https://github.com/rmerco-clemson/AuE893Autonomy.git>

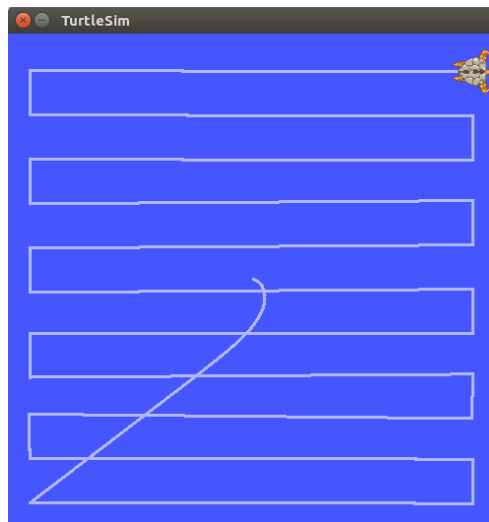
### Commands for launching the applications

#### Robot Cleaner – grid logic

The following command will run the turtle simulation in order to execute the Robot Cleaner application following a grid pattern to cover all the room:

```
> roslaunch assignment_01 turtlesim_grid_cleaner.launch
```

A rosbag file able to replay the Twist messages is in the folder bagfiles. A readme file is also provided. Figure 1 shows the results of the simulation.



*Figure 1: Robot Cleaner application: grid pattern*

#### Robot Cleaner – spiral logic

The following command will run the turtle simulation in order to execute the Robot Cleaner application following a spiral pattern to cover all the room:

```
> roslaunch assignment_01 turtlesim_spiral_cleaner.launch
```

A rosbag file able to replay the Twist messages is in the folder bagfiles. A readme file is also provided.

Figure 2 shows the results of the simulation.



*Figure 2: Robot Cleaner  
application: spiral pattern*

### **Robot Cleaner – Gazebo grid logic**

The following commands will run the same application of the turtle simulation in Gazebo. In particular in Gazebo has been reproduced the Robot Cleaner application following a grid patten to cover all the room. In this case two closed loop controllers are implemented:

- PD controller for controlling the forward speed of the robot during the cruse to the next point
- PD controller for controlling the orientation of the robot during the cruse to the next point

First of all the Gazebo world has to be launched:

```
> roslaunch assignment_01 ten_squares_gazebo_world.launch
```

After that the previous command is completely executed and Gazebo is correctly running, use the following command:

```
> roslaunch assignment_01 ten_squares_grid_cleaner.launch
```

Figure 3 shows a screen-shot of the simulation while it is running.

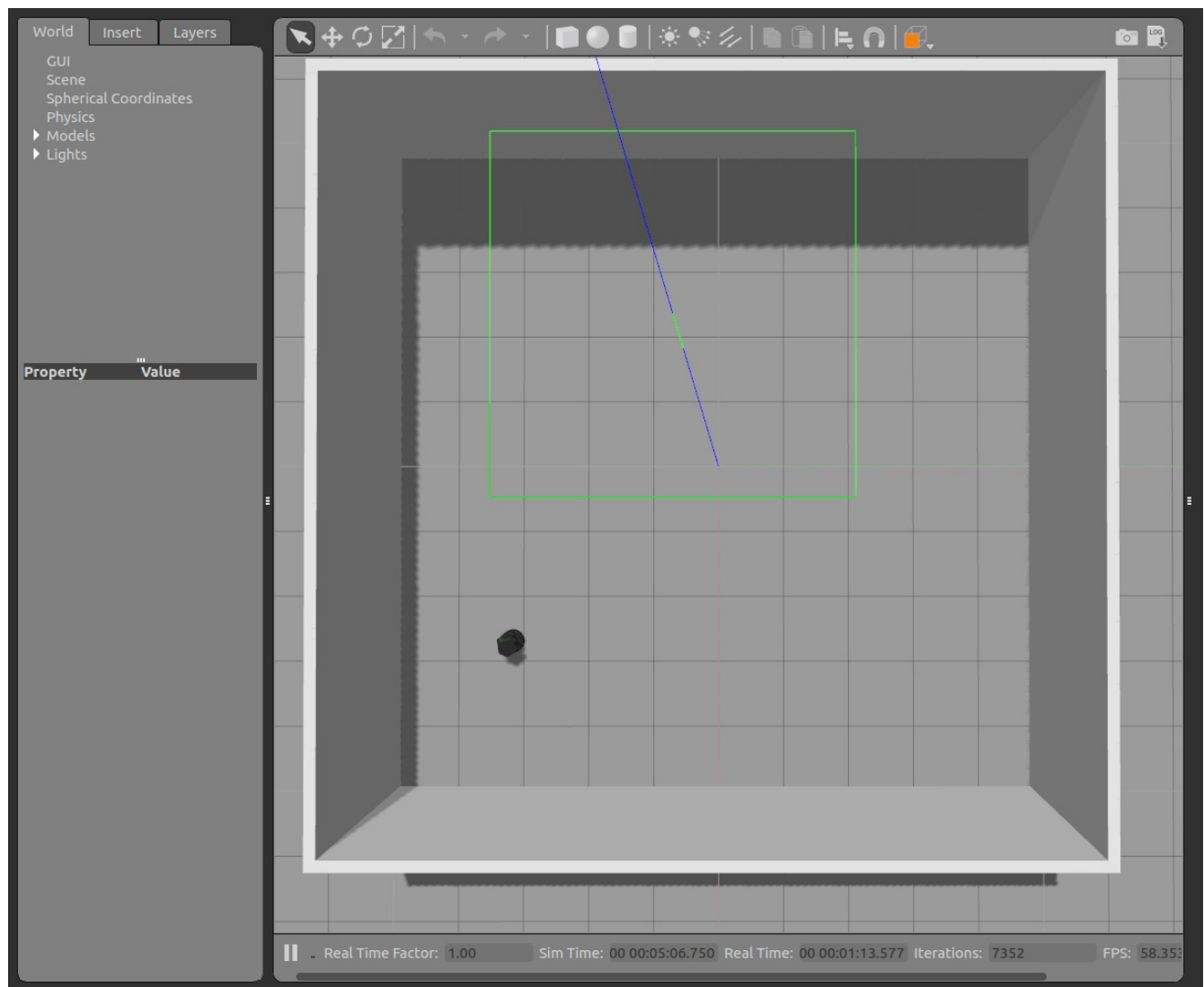


Figure 3: Robot Cleaner application simulated in Gazebo