



**Michigan
Technological
University**

MEEM 4707: Autonomous system

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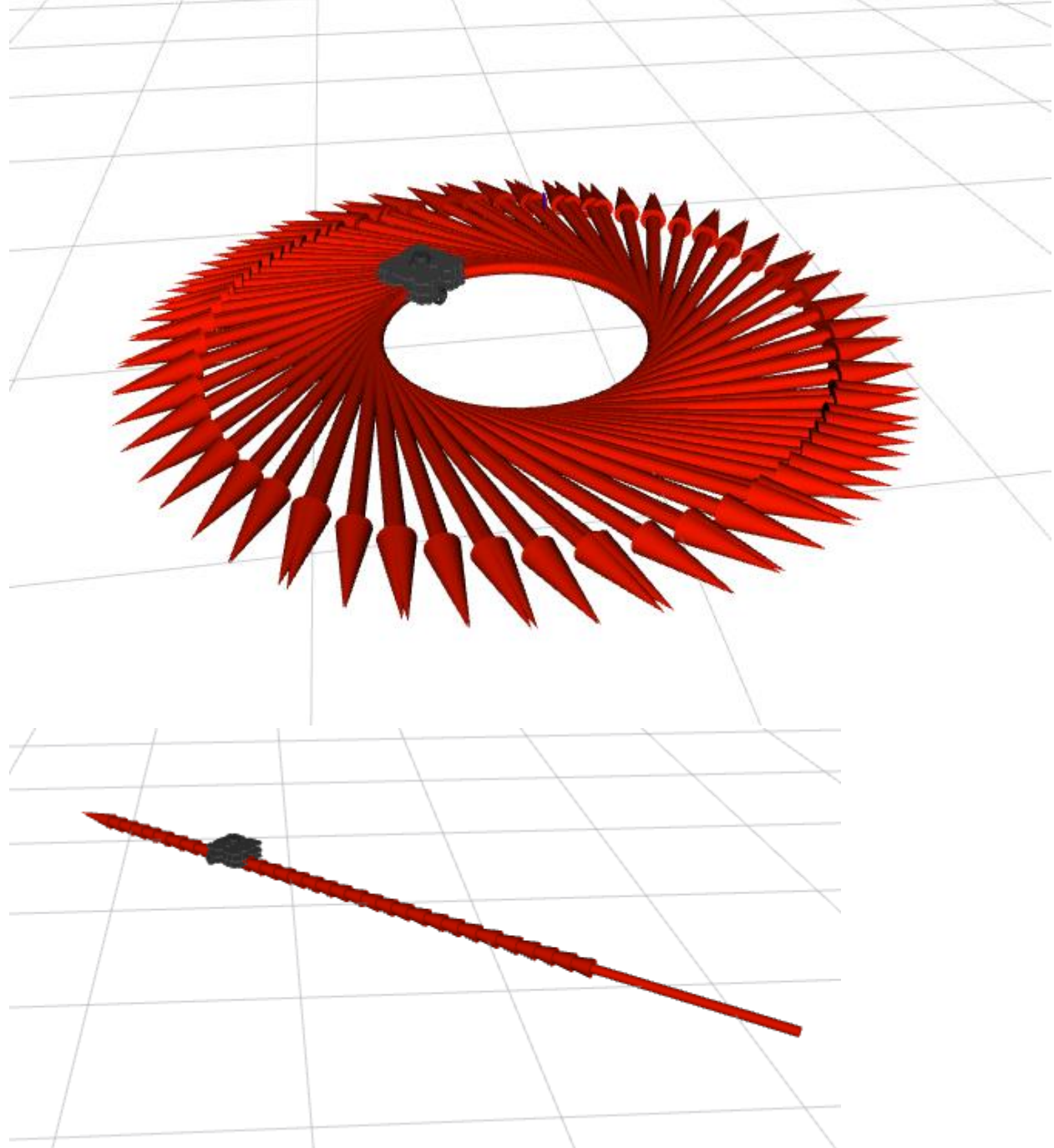
Lab - 1

By

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Problem 1

Download the source codes and place them inside src in the catkin_ws folder we have made. **Capture your robot movements and paste them into the report. (You may use snipping tools. Please do not take a photo of the screen using your phone.)**



Discussion from Lab1

- Objective

The objective of this lab was to familiarize ourselves with the ROS/python environment, as well as to practice commanding different types of movement from the simulated robot. Using a simple commandable object (turtlebot), the goal is for us to make the robot move linearly and rotationally.

- Approach to achieve the Objective

To accomplish this objective, we utilized the catkin_ws and turtlebot3 programs provided to jump straight into a configured environment. Once it was established and running using the ROS command hierarchy, the rotational and linear rates were changed to produce rotation and straight-line motion.

- Challenges faced and countermeasures taken

While there were very few hiccups getting the environment working, the command hierarchy of ROS did take a bit of playing-around with to understand. We were initially confused about which terminal to run the commands in, but eventually we figured out that both “roscore” and “roslaunch” had to be run from the same terminal.

- The difference in strategy: Pre-lab vs. Lab strategy

As there was no pre-lab, there was no original strategy that we deviated from. The documentation for this lab was thorough, so our strategy largely consisted of following along step-by-step and troubleshooting when things didn’t run as expected.

- Observations and Learnings

It was good to get familiar with the environment and general functionality of ROS, which is far more asynchronous than I originally thought it was. It’s interesting how it’s structured similarly to microservices, which opens a lot of opportunities for running intensive code parallel to time-sensitive code without unnecessary blocking.