

**ENPM809T Assignment #8**

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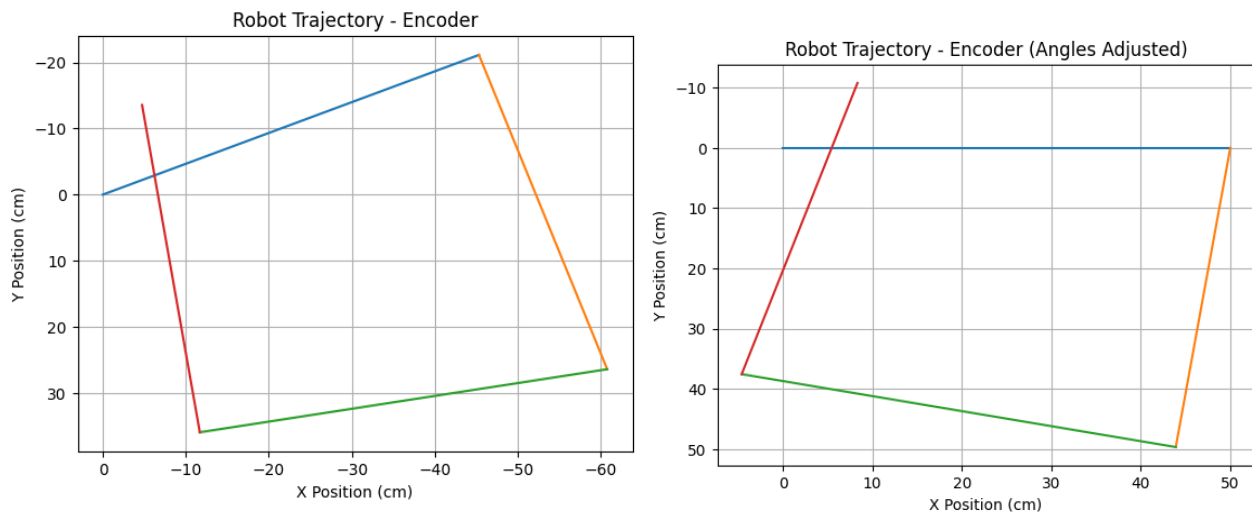
*University of Maryland*

*Course code:* ENPM809T Autonomous Robotics

*Instructor :* Steven E. Mitchell

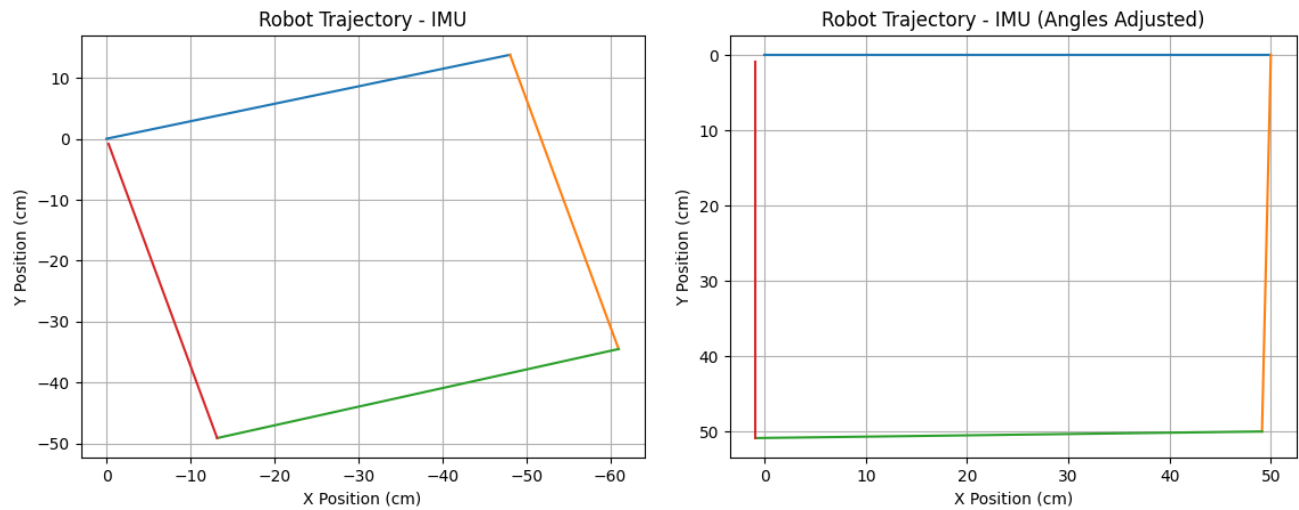
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**Question 0.1: (No submission)****Question 1:****Robot Platform: Baron****1: imu01.py works perfectly****2: In Class Exercise:****a) Position Data - Encoders only**

Since the initial yaw value of the IMU was not 0, the plot appears to be skewed. The plot on the right is adjusted to make the initial yaw value 0 degrees. We can observe from the video and the plot that the encoder values are not reliable for rotating the robot since wheel slip cannot be taken into account, due to which the turns are not 90 degrees. The robot travels in a straight path for 50cm accurately due to the encoder integration, but its rotation is not accurate.

## b) Position Data - Encoder + IMU



By integrating the IMU, the robot rotates accurately by 90 degrees each time, which is a major improvement compared to using just encoders for robot rotation. Since the IMU provides accurate yaw values, the robot is able to correctly rotate to the required orientation. We can also notice that the robot slightly skews while moving forward which is due to wheel slip.

Link to Youtube Video: <https://youtu.be/nnujjhOOlyg>