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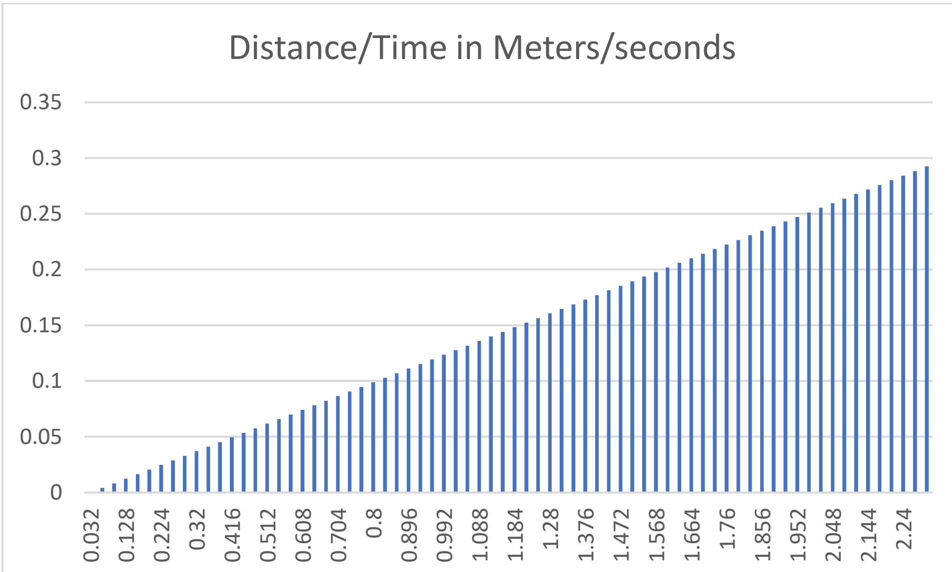
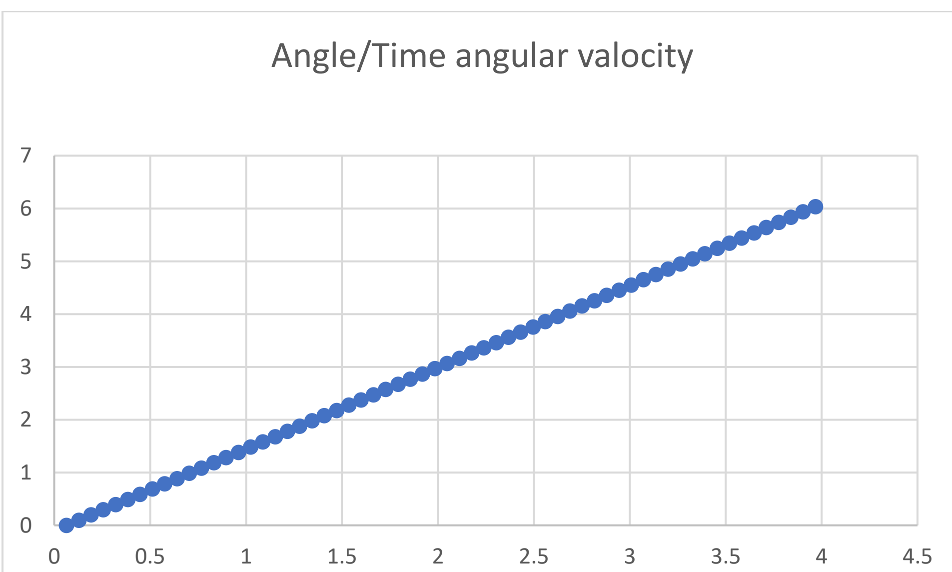
CDA4621- LAB1 report

1) Plot for Task1:



Y axis is for Meters
X Axis is for seconds

2)



Y axis is for the angles in radians
X axis is for time in seconds

3)

Task 1 uses simple kinematics V=d/s and linearvelocityofwheel=angularvelocity*radius

Task 2 uses the overall angular velocity of the robot which is Vl-Vr/2 as well as linear velocity of each wheel

In task 1 if the time given is too short for the task a message is displayed and nothing is done.

V=d/s, we know v and d and s is entered by the user, so if s!=d/v the motion is impossible or duration of the motion is > the time inputed by user

We already know our velocities, so we know how long each motion/rotation is going to take, so simple if statements allow us to display those messages.

Task2, we know our angular velocity, so if we want to know if we can rotate at some angle at some given time we just multiply the time by the angular velocity and if it is less than the angle desired, the motion is impossible.

Task3: We need to use sin and cos of angles a and b to know the length of each side of the trapezoid.

We know or assume to know W and H, so the length of the other sides are:

sin(b)*H

sin(b)*H

we assume a position of (0.H/2), we also assume that when the robot hits the W side when first travelling up it hits it at W/2

Task4 used the formulas bellow:

vl= w (R+dmid)

vr= w (R-dmid)

v= wR = (vr+vl) / 2

R and omega are given we calculate vl and vr and v accordingly and decide if the motion is possible.

Conclusion:

It Is important to note that these results given by this assignment are affected by the real ability of the software to simulate reality.

Theoretically speaking, we should have been able to get exact values by the exact second, but due to frictions and the clock we always get close values.

The faster you spin the robot the more arbitrary values you get as you start getting slippage.