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Professor Wolfe

ELEN 123, Mechatronics

**Prelab 6**

It was asked to calculate the ratio of wheel-sensor interrupts to distance traveled. The ratio is 33 interrupts : 247 millimeters.

It was asked to estimate the maximum forward speed of the robot. The H-bridge allows a maximum of 7 Volts at the Enable pins. For an operating voltage of 7 volts the motor runs at a speed of 180 rpm. A little bit of math allows us to write this as 3 revolutions per second (rps) and thus

[mm/s]

It was asked to document the piece-wise-linear model that matches your Sharp sensor. For distances from 5 to 40 centimeters in increments of 5 centimeters, these are as follows:

X = 5:10 cm; y = -5.9242x + 16.434

X = 10:15 cm; y = -16.129x + 27.516

X = 15:25 cm; y = -39.447x +

**Describe a control algorithm for Task 3.**

Our algorithm will check whether we are within 19.5 to 20.5 cm from our target using the SHARP sensor. If we are outside of this target range we will move forward or backward depending on whether we are farther than 20.5 cm or closer than 19.5 cm respectively. If we are within the range our robot will set there until this is no longer the case.

**Include a selfie from your planning meeting including your team flag.**

