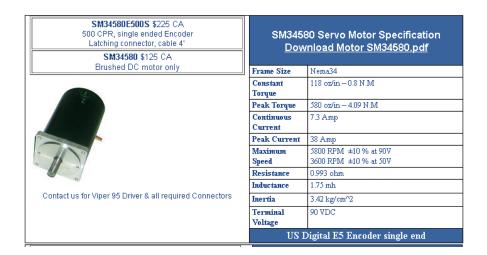
ECE 331 - Homework #10

DC Permanent Magnet Motors. Due April 23th, 4PM

A single SM24580 DC servomotor is to be used for an RC car.

http://www.motiontek.ca/dcservomotor.html

1) Determine (or estimate) the motor parameters: Kt, Ra, La, Inertia, Friction



One comment from battlebots is small wheels give your torque while large wheels give you speed. Assume you have a 90VDC power supply.

- 2) Plot the torque vs. speed for this motor assuming it directly drives a wheel with a diameter of 3cm
- 3) Plot the torque vs. speed for this motor assuming it directly drives a wheel with a diameter of 30m

Assume your RC car has a mass of 20kg. Determine the time it takes your car to complete a 100m race

- 4) With 3cm wheels
- 5) With 30cm wheels
- 6-7) What is the optimal diameter of wheel for this motor / car combination in a 100m race?