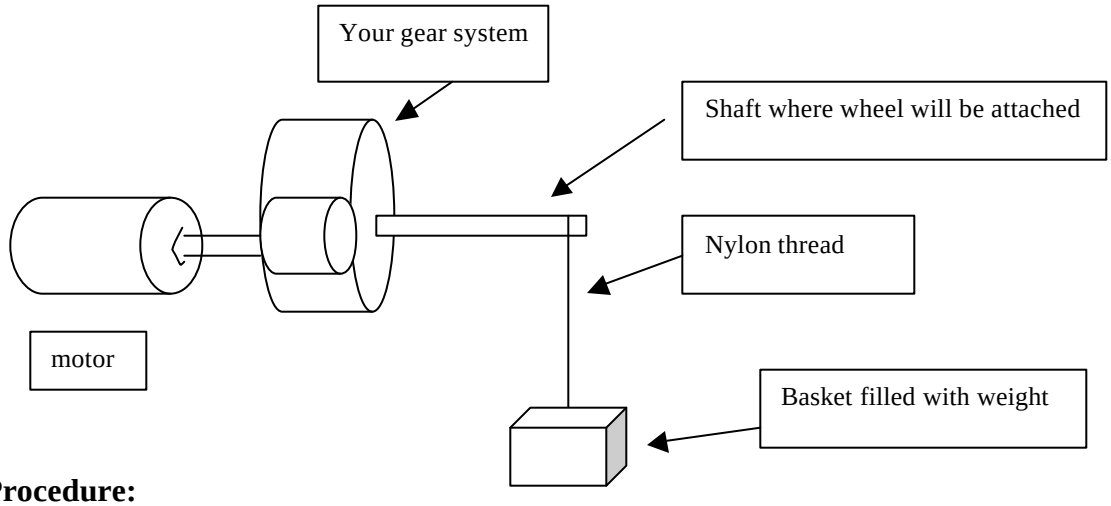
Performance Tests: (extra credit 10%)

1. Output Torque of your Gear system

Nearly all of the mechanism in robots, including drive trains and actuators, require more torque and less speed. Best way to optimize the output torque is to use gears. Using gears, the high speed motor is traded off into torque. This test is to provide you the information on the output torque of your gear system.



Procedure:

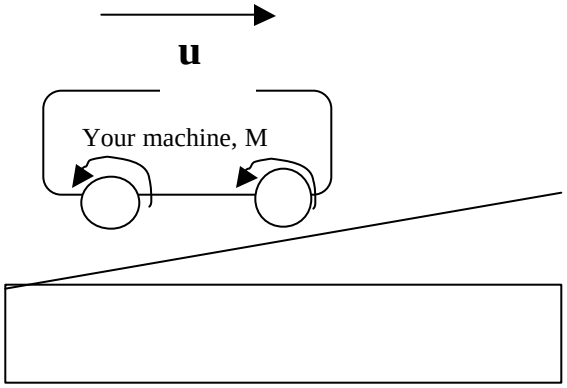
To measure the torque, attach a weight (measure the weight on a scale before begin the test) to the shaft where you will put the wheel using a nylon thread. Apply power to the motor (at maximum level), and the thread will begin to wind around the shaft. To find the maximum torque delivered by the system, you gradually increase the weight until the thread stop winding around the shaft.

The maximum torque delivered by your actuator can be calculated using following equation,

$$\text{Torque} = r \times F$$

Where r is the radius of the shaft and F is the weight hanging on the thread when thread never wind.

1. Average Speed in Time Trial



Please do a time trial on the obstacle course without the robots from the opposing teams. Record the time it takes to cross the entire course and find the average velocity "u " by diving the time by the distance it has traveled (~ 20 ft).