

ME185 Lab 1

TA: Ben Stabler <stabler@stanford.edu>

1.0.0 Summary

During the first lab you will drive an electric go-kart around a track collecting data using a datalogger. You will need this data for the second lab, at which point you will construct a model for the go-kart and compare the model with the data that you gathered.

1.1.0 The Go-Kart



The Go-Kart was built by an ME185 team in 2012. The kart is equipped with 40Ah lithium batteries and a 6Hp (continuous) brushless motor. The chassis is designed for a shifter kart.

1.2.0 The Datalogger



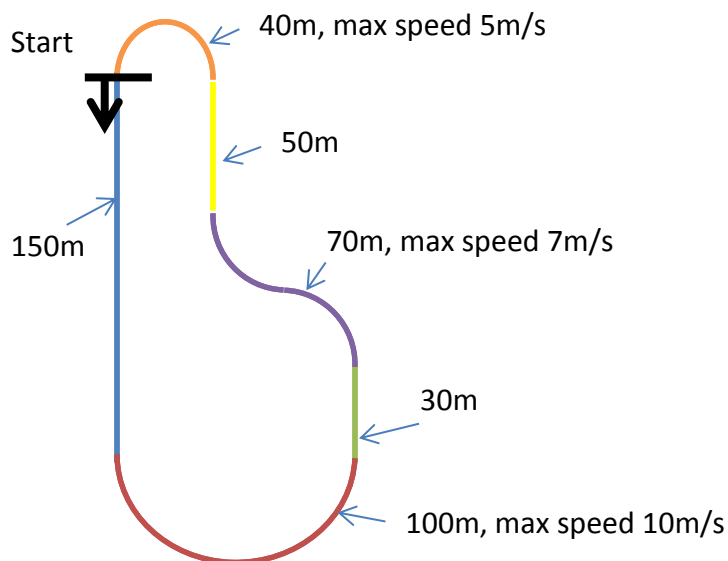
The datalogger is based on an Arduino Uno (<http://www.arduino.cc/>) and a custom datalogger shield. The datalogger shield contains a SD socket, a 3 axis accelerometer, a 3 axis gyroscope, a switching power supply and signal processing circuitry for battery voltage, battery current and speed sensor measurement.

The datalogger is programmed to record measurements approximately every 20ms. You may want to borrow the datalogger, or buy your own Arduino and acquire a datalogger shield from the TA, in order to help you characterize your vehicle later in the quarter (and demonstrate that you met your performance specification!). Depending on your requirements, you can reprogram the datalogger to fine tune the parameters you are trying to measure and the rate that it records data.

Design files for the datalogger shield and Arduino code are available on the ME185 website!

1.3.0 The Track

The track should be set up as follows:



In the second part of the lab you will be comparing your real-world data against an analytical model so it is important that you have a well-defined course or your numbers will be very different!

1.4.0 The Task

Record data for two (continuous) laps in the Go-Kart using the datalogger. When you have completed your laps, copy the data from the SD card and remember to bring it to the next lab.