Due Date and Demonstration (Race)

- Due date: Monday, July 16, 2018.
- Report due by 7 AM of due date.
- Race will take place during class period of due date.

Synopsis

Working in groups of two, use the Arduino-bot (chassis with tailwheel, 2 servomotors, 2 optical encoders, only) to race a 10-foot straight path. The algorithm executed on the Arduino must implement the control theory presented in the course. System modeling and analysis must support the parametric values (i.e., gains) used in the control algorithm.

Report Submission

1. *System model*. Explanation of the physics modeled. Mathematical representation of the model (governing equations, transfer functions). Experimental techniques used to identify model and parametric values identified supported by measured data.
2. *Control system design*. Using the identified model, design a feedback control system using Matlab/Simulink. Report gains that provide the desired performance of the closed-loop system supported with numerical and simulation results (e.g., root locus, time domain response).
3. *Arduino program*. Provide in the report (electronic copy not necessary) the Arduino program implemented. Provide adequate comments that detail the purpose of each section of code.

Notes

- Each team is responsible for transitioning across tabletops.
- No human interaction allowed, except for preventing robot from falling off table. Any human interaction will result in disqualification.

Race Bracket