SDSU Spring 2018 Mini-Sumo Competition

Objective:
To design and build a robot capable of battling (and winning) in a Mini-Sumo robotics contest to be held on May 1st in the Senior Design Lab (E217).

Project Overview:
Two robots compete in a head-to-head battle following the basic system of traditional human sumo matches. Robots are not allowed to use offensive weapons or jamming mechanisms to disable the opponent. The purpose is a pushing match between the two robots to force the other from the ring. We will use a set of rules based on the Robogames Unified Sumo Rules for the Mini Autonomous class with a couple of alterations. The robots must operate in a fully autonomous mode once a match begins and remain that way until a point is awarded. The Mini-Sumo robot is restricted to a weight of no more than 500g and a length and width of 10cm. We will use an IR start trigger as opposed to the button start used in the Robogames contest. The specification for the IR Start code will be made available by the 5th class meeting and a test remote will be available in the lab.

This project will require some mechanical design and fabrication; however, the vast majority of the work will rely on your ability to apply an array of Electrical and Computer Engineering skills. For autonomous operation; a sensor system will be needed in order to detect the position of the opponent and the boundaries of the playing field. For locomotion; a power electronics system comprised of batteries, motors and motor drive electronics will need to be designed. For control and navigation; an embedded system will need to be interfaced to the power electronics and sensor systems. Embedded firmware will be written to use the sensor readings to control the motors and execute a strategy to defeat the opposing robot. All of these systems must be packaged in a way that provides for reliable operation and meets the contest weight and size constraints.

Playing Surface (Dohyo):

Mini-Sumo

Dohyo Diameter: 77cm

Border Line Width: 2.5cm

Starting Line Width: 1cm

Starting Line Length: 10cm