Simon Fraser University
School of Mechatronic Systems Engineering
MSE110 Mechatronic Design I

PROJECT – SUMO

Demonstration Date: as posted on Canvas

Overview

LEGO Sumo is a contest where two autonomous LEGO robots attempt to push or overturn each other out of a circular ring. The first robot completely exiting the ring loses, i.e. the last robot remaining in the ring wins the round. The winning robot that wins the most rounds wins the contest.

While pushing the opponent's robot out of the ring is the most common way to win a round, disabling your opponent (flipping, lifting, etc.) can also result in a win.

Bout Procedure

Each robot will compete against other robots chosen for the competition in single combat (termed a round) on as many as three separate attempts in case of a draw game result (termed a bout). At the end of the event, the robot with the highest cumulative score will be declared the winner.

Each round will be limited to three minutes or three bouts, whichever comes first (if at the end of that time there is no winner, the round will be declared a draw).

If during a bout, the robots are entangled and wear and tear is occurring, both contestants can agree to a restart that bout. The robots may be restarted but the three-minute overall time limit still applies (in other words, once three minutes are up the result of the round is determined by the results of the completed bouts, even if three bouts were not completed within that time).

Starting a bout:

Robots must be started facing opposite sides and separated by a 12-inch gap. At the start of a bout, the first motion should be directly away from the center. each robot must move forward until it reaches the outer white line of the arena, turn 180 degrees using encoder values (not time delays) then start searching for the opponent robot.

If there is no clear front of back to a robot, the direction of this first motion where the color sensor is located will define the "front" for purposes of the initial facing of the robots. A robot must start moving forward within ten seconds of the start of a bout.

Robots must be capable of some form of movement across the ring surface.

Arena

LEGO Sumo takes place in a circular ring four feet (122 cm) in diameter with a two-inch (5 cm) white border along the ring's perimeter. The surface of the ring is smooth ¾" plywood (painted black) and is about one and one half inches (3.8 cm) above ground level. The raised platform helps to determine when a robot has "fallen off". This is generally determined by the robot being in contact with the ground outside the ring, but is also left up to the judge's discretion.