Sumo Bot Competition Spring 2018

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What is a Sumo Bot Competition?

General Overview

Two robots are placed on a circular sheet of plywood painted black with a white border. These two robots autonomously attempt to push each other out of the ring. The first robot to fall out of the ring loses the round. The competitions "are non-destructive, family friendly, and great learning experiences." The SPARC competition will be on April 17, 2018 at 5:30PM on the first floor of Broun Hall assuming there are at least 4 robots that pass qualification. Robots will be built individually or on teams up to three people.

Goals of the Competition

- To be a great learning experience for all participants as it requires the following skills to build an effective robot:
    - mechanical design/3D printing
    - electrical prototyping
    - sensor and control systems
    - C programming
- To increase interest in robotics development within SPARC to allow the organization to compete in inter-university competitions at a competitive level.
- To allow students the opportunity if they desire to purchase the completed robot from SPARC so that they could have a platform to experiment with as the parts allowed in the competition will be very affordable and easy for the organization to obtain.

What are the Rules for Building the Robot?

General Rules

Rules are based on: http://www.robotroom.com/SumoRules.html

- Weight Constraint: < 750g(1.65lbs)
- Size Constraints (at start of round)
    - Width: 15cm (5.91”)
    - Length: 15cm (5.91”)
    - Height: ∞
- Robots must not intentionally
    - Deactivate or damage the opposing robot in any way
    - Emit smoke or fire
    - Leak, stain, or soil
    - Disperse powder, grit, or grime
    - Spray, throw, or use projectiles
    - Jam, shock, or electromagnetically interfere
    - Snare, entangle, or employ nets/rope
    - Scratch, gouge, or scrape
    - Have sticky/magnetic/suction apparatuses that contact the arena surface
    - Detach parts or mini bots
- Robots may
    - Push, shove, and flip the opposing robot

Parts Provided in Kit

- 1 x Arduino Nano Clone: Longruner Mini Nano V3.0 ATmega328P 5V
- 1 x 2 pack of Micro Continuously Rotating Servo w/ wheels
    - 1 additional servo found in SPARC lab is allowed
- 2 x Ultrasonic Sensor: Elegoo HC-SR04 Ultrasonic Module Distance Sensor
- 4 x line Sensors: SPARKFUN REDBOT SENSOR - LINE FO
- 1 x 4 AA Battery holder: LAMPVPATH 3 Pcs 4 x 1.5V (6V) AA Battery Holder
- 1 x 4 Perma-Protoboard: Adafruit Perma-Proto Half-sized Breadboard PCB

Parts Found Around the Lab

- 3D Printing Filament
- Electrical Prototyping Wires
- Screws, nuts, washers etc. from McMasterCarr (upon request)
- Any electrical sensor or component found in SPARC lab under the retail cost of $35
- Zip ties, Velcro, and Tape

Parts Disallowed

- Sheet metal and non 3D printed sheet plastic
- Extruded metals and non 3D printed extruded plastics
- Chemicals and biohazards
- Any parts purchased that are not approved by a SPARC officer for this competition

Game Play Rules

See: http://www.robotroom.com/SumoRules.html

Additional Information

- No bricks allowed: each robot must move within first 20 seconds of round under its own power or else will lose the round. A single rematch may be done in order to allow a technical issue to be resolved if the bot loses due to this reason.
- Each round will have a time limit of 2 minutes.