



# ROBOTICS CHALLENGE

## Challenge Description

### “Sumo”

Design a robot to “sumo wrestle” another robot. Robot sumo wrestling is a contest where two or more robot contestants try to push each other out of a circular ring. The first robot to be pushed completely outside of the ring loses. The last robot remaining in the ring wins.

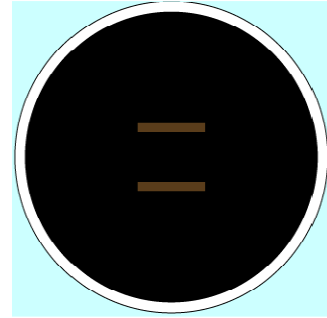
## Specifications

- **Size:** Maximum robot dimensions are **that the robot fit completely inside the square, white box that comes with the kits**. Parts of the robot may extend outside this region *after* a match has started.
- **Sumo Ring Details:** The sumo ring has a diameter of about 2 feet.
- **Prohibited Items and Actions:** A robot may not spray any material on the ring or on their opponent, or in any way deform the sumo ring. Robots are not allowed to use any flying components or projectiles. Robots may not electro magnetically interfere with the other robot or its sensors. Providing an environment which misleads the opponent's robot is allowed (for example, putting a black flap down over the white ring edge line, hoping the other robot will not detect the edge and fall off).
- **Allowed Items and Actions:** A robot may use various forms of detection to locate the other robot (light sensor, touch sensor, rotation sensor). It may also incorporate stealth technology to avoid detection by the other robot. Signals may be used to try to confuse the other robot's detectors, such as flooding the area with light, touching the robot to mislead it, or convincing the other robot it is at the edge of the ring. Overt attempts to damage the opponent's robot, over and above the expected ramming and pushing, are not allowed. No rotating blades, flame-throwers, ion cannons or any other form of weapon are allowed!
- **Match Rules:** Each bout will last a maximum of 3 minutes. If after 3 minutes, both robots are still in the ring, 50 points to each player.

**Match Start:** A referee signals the start of each bout. The operators will indicate to their robots the start of the bout.

The sumo ring has a diameter of 75 cm (about 3 feet), and is raised 5cm (about 2 inches) above the floor. The color of the ring is black, with a 5cm wide white edge boundary.

Challenge starts with opponents facing each other at the center lines.



- Robots must be made with LEGO Mindstorms Robotics Invention System and be programmed with Robolab programming environments.
- Robots can consist of a maximum 1 RCX, 8 Wires, and 3 motors.
- Nothing can be added or removed from the robot during a round.
- No non-lego parts are allowed
- Challenge is maximum 3 minutes long

## Adaptations

Send / block the sending of malicious code through the infrared transmitter.  
Send successful program that causes your team to win, get 50 extra points. Block a virus attempt, get 75 extra points.

## Scoring

This challenge must be carried out with another willing team. **Teams may only participate in TWO total matches for the whole of the course.**

100 points to the winning robot

60 points to the losing robot

50 points each in case of a stalemate (no winner after 3 minutes)

Note the disqualifying actions described above.

Players may not pick up their robots in this challenge until the winner is found or the 3 minutes are up.

Up to 25 points will be deducted from the total score for the total amount of damage sustained by the robot, as determined by the judge.

## Hints and Tips