



2017 SumoBot Challenge

A Bridge Challenge to the [Robotex Competition](#)

This challenge concludes in a single elimination tournament - Top 9 teams from each division, based on performance from Friday and Saturday scores, will compete for awards to 1st, 2nd, and 3rd places on Saturday, May 6th.

Goal

To design, build, and program an autonomous robot that can push one or more opponent sumo robot(s) off an elevated wrestling ring. Sumo robot with a maximum weight limit, 1 kg for ES/MS Mini Class, 2 kg for MS/HS Medium Class, and 3 kg for HS/BK Mega Class.

Who Can Play

Teams of **2 to 4 players** in **separate classes** for:

- Elementary School + Middle School = Mini Sumo
- Middle School + High School = Medium Sumo
- High School + Big Kids = Mega Sumo

Required Materials

Autonomous robot, any platform, costing \$1,500 USD or less, and meets the following design constraints, which will be verified during **Check-In on May 4th or 5th, 2017**:

- Robot can demonstrate it is running an edge avoidance and opponent search program by negotiating the Sumo ring from the assigned starting position.
- Team members are the only people allowed to design, construct and programming of Sumo robots.
- Base of the robot must **not** exceed 400 square cm. With no height limit.

Class	Weight
Mini Sumo: ES/MS	1 kg
Medium Sumo: MS/HS	2 kg
Mega Sumo: HS/BK	3 kg

Challenge Specifications

Robot Restrictions (Not Allowed)

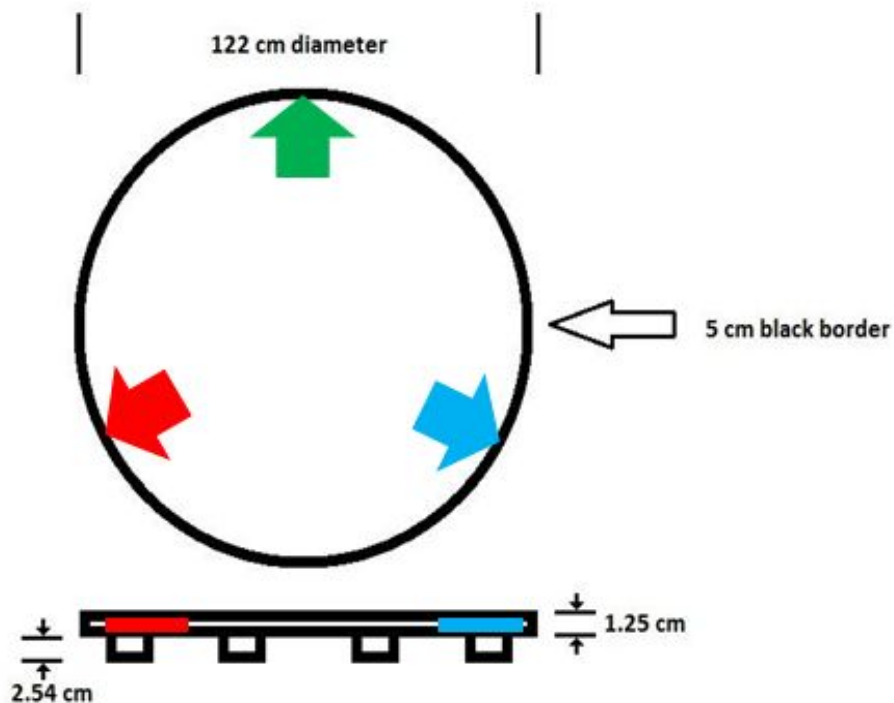
- Jamming devices, such as IR LEDs, intended to saturate the opponents IR sensors.
- Parts that could break or damage the ring or the other robot(s).
- Parts that are intended to damage the opponent's robot or operator. Normal pushes and bangs are not considered intent to damage.
- Devices that can store liquid, powder, gas or other substances for throwing at the opponent.
- Sticky substances to improve traction.
- Devices to increase down force such as a vacuum pumps and/or magnets.
- No sharp edges.

Ring Specifications

- Approximately 122 cm diameter white circular area with an approximately 5 cm black edge border.
- Sumo ring constructed with approximately 1.25 cm thick plywood or other suitable non magnetic material.
- The Sumo ring is to be elevated by approximately 2.54 cm by various support block attached to the bottom of the Sumo ring, support structures must be at least 1 cm from the top edge of the Sumo ring.

Robot Placement

- Painted on the edge of the sumo ring will be three colored edges approx 20 cm in length spaced 120 degrees apart.
- Upon the track monitor's instructions, teams will center their SumoBot on one of the colored edges facing outboard.
- SumoBot's must be placed near the edge so that their SumoBot breaks the plane of the inside edge of the black line.



General Rules of Play

- Sumo matches are quick and often end in a draw. You will have a match card that allows you up to 25 matches. The 10 top scores of your 25 matches will be your overall score.
- During the scoring period teams report to the judges table and check in, you will be told which ring to go to for your match.
- Every effort will be made to start 3 robots in all sumo matches. However, if needed a match can be between just two teams (in this situation max points possible is only 2).
- If two Sumobots fall at nearly the same time, the LAST Sumobot to hit the floor, as determined by the track official, will be awarded the point.
- Only one team member may sit ringside and start the robot, other team members need to be seated behind them in support of their SumoBot.
- Each team competes on a sumo ring with a robot that they have constructed themselves to the specifications listed within this document.
- The match starts on the track monitor's command and continues for 1 minute, or until there is only one SumoBot left on the Sumo ring, whichever occurs first.
- There is **no time bonus** in Sumo.
- The track monitor's decisions are final, they determine the winner of the match.
- Sumobots pushed off the edge of the sumo ring are eliminated for that match.

Scoring Period

- Friday, May 5th, 8:00AM to 5:00PM.
- Saturday, May 6th, 8:00AM to NOON.
- Teams are **strongly** recommended to begin scoring their robots on Friday to insure they will get the minimum 5 scored runs in by NOON on Saturday.

Scoring

Teams accumulate points during Sumo Matches. **The max points that can be earned in a single match with (3) SumoBots is 3 pts; in a match with (2) SumoBots is 2 pts.**

- Any time a SumoBot is pushed off the edge of the ring a point is awarded. When two SumoBots are both in physical contact when the third SumoBot is pushed off the edge, then both surviving SumoBots receive a point.
- In a match that starts with three SumoBots, if only one SumoBot is left when time is called, then a bonus point is awarded to that SumoBot.
- The match will be stopped and restarted for the remaining time under the following conditions:
 - The remaining SumoBots show little to no perceivable movement (a stalemate) in excess of 5 seconds.
 - If it is unclear whether progress is being made or not, the track monitor can extend the time limit for observable progress for up to 15 seconds.
- The 9 SumoBot teams with the highest 10 match scores will compete in the tournament.

Tournament Scoring

The top nine teams will be paired into three groups and compete in a 3 round tournament.

Round One: Each group will fight until one SumoBot is pushed off the ring.

- The losing SumoBots for each of the three matches are eliminated.
- These SumoBots place 7th, 8th, and 9th respectively according to their 10 match aggregate score.

Round Two: The remaining six teams will fight until one SumoBot is pushed off the ring.

- The losing SumoBots for each of the two matches are eliminated.
- These SumoBots place 5th and 6th respectively according to their 10 match aggregate score.

Round Three: The remaining four teams fight in an all or nothing SumoBot Throwdown starting around the ring at 90 degree intervals.

- 4th place to the first SumoBot pushed out.
- 3rd place to the second SumoBot pushed out.
- 2nd Place to the third SumoBot pushed out.
- The surviving SumoBot is the Champion!