

Sumobot Challenge Official Rules (RoboRAVE Kaga Japan 2018)

● **Goal:** To design, build, and program an autonomous robot that can push one opponent sumo robot(s) off an elevated wrestling ring. Sumo robot with a maximum mass limit, 1.5kg for ES/MS/HS.

● **Who Can Play:**

Teams of 2 to 4 players in one division for:

- Elementary School
- Middle School
- High School

● **Requirements:**

• Autonomous robot (any platform, costing \$ 1,500 USD or less, and meets the following design constraints, which will be verified during check-in:

- **Volume of the robot must NOT exceed 18cm × 18cm.**

Weight	Length*	Width*	Height
1.5kg	18cm	18cm	Unlimited

*Robot is measured by the box of 18 × 18 cm with + 2 mm tolerance.

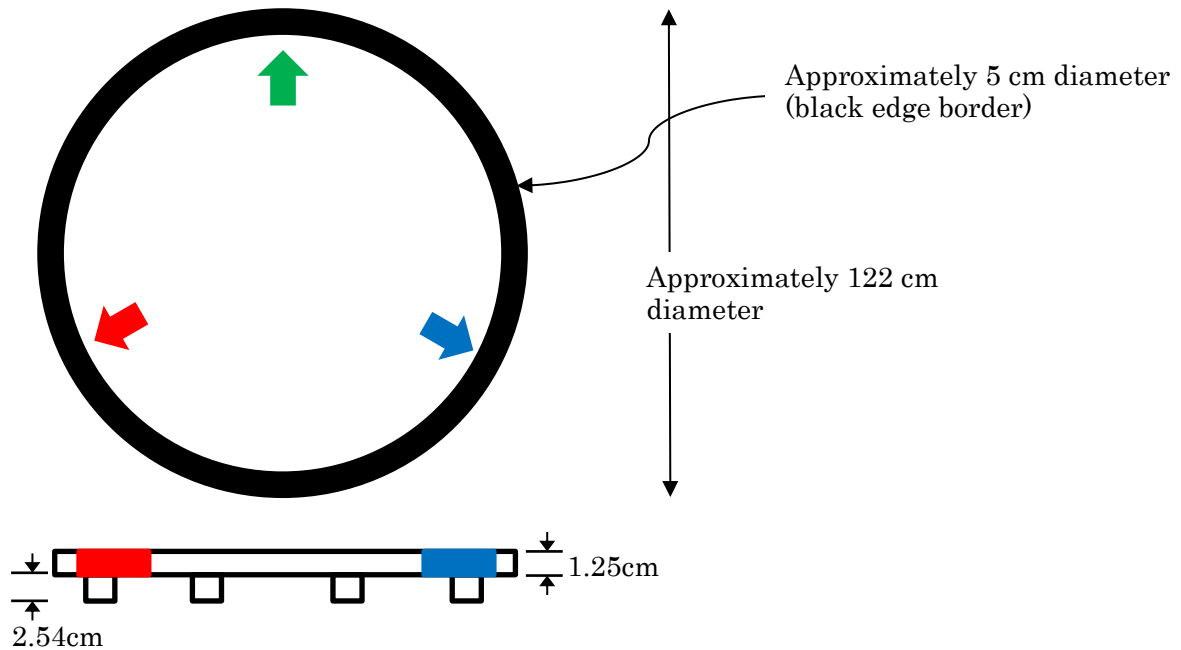
- Multiple sensors and processors are allowed.
- **Team members are the only people allowed to design, construct and programming of Sumo robots.**

● **Prohibited Components of the Robot:**

- Any components that may disturb the operation of the opponent (for example, flashlights or jamming devices such as IR LEDs intended to saturate the opponents IR sensors).
- Any components that may damage or scratch the surface of ring. An exception is when the robots collide.
- Any components that are designed to damage or break the opponent's robot or operator. Normal pushes and bangs are not considered intent to damage.
- It is forbidden to use any liquids, powders and gas as a weapon against the opponent.
- It is not allowed to use any inflammable materials in the robot.
- The robot must not include any throwing devices (for example throwing a net on opponent).
- The robot must not include any parts, which fix it onto the ring (for example, magnets, glues, suction cups, a vacuum pumps, etc.).
- The robot must not include sticky substances to improve traction, and also sharp edges.
- It is forbidden to make the components detachable intentionally.
- **No lifting wedges.**

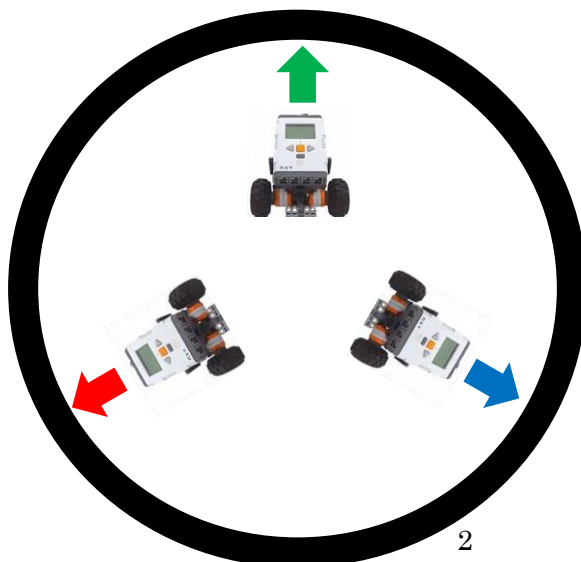
● **Challenge Ring Specifications:**

- 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, 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.
- SumoBots must be placed near the edge so that their SumoBot breaks the plane of the inside edge of the black line and facing outward / away from the center.



●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 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:

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 the winner.
- 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 from each division will compete in the final tournament.
- Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).

“RoboRAVE Kaga Japan 2018” 9 Team Tournament Bracket

Tournament Placing

• The losing teams from Round 1 will place 7th through 9th in accordance with their aggregate score coming into the tournament.

• The losing teams from Round 2 will face each other in Round 3 to determine the 5th and 6th place winners respectively.

• The winning teams from Round 2 will face each other in the Championship Round to determine the 4th, 3rd, and the 2nd place winner, and the Tournament Champion.

