

Sumobot Challenge Official Rules (RoboRAVE Kaga Japan 2017)

●**Goal:** To design, build, and program an autonomous robot that can push one opponent sumo robot off an elevated wrestling ring. Sumo robot with a maximum weight limit is 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

●**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:

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

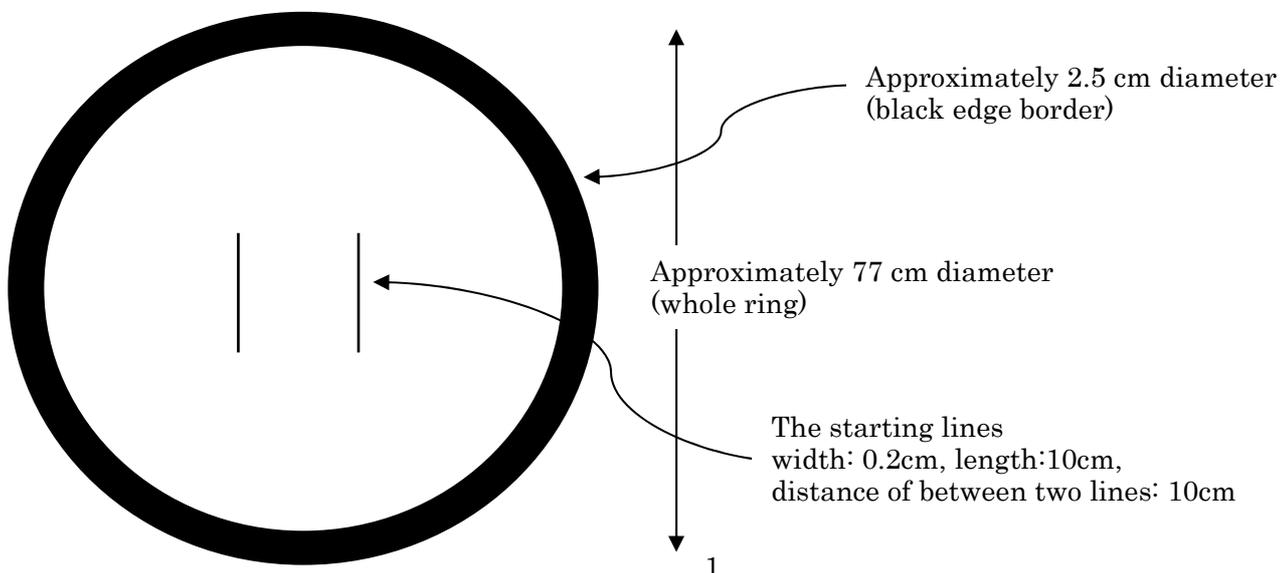
Weight	Length*	Width*	Height
1.5kg	18cm	18cm	Unlimited

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

- Multiple sensors and processors are allowed.

●**Challenge Ring Specifications:**

- Approximately 77 cm diameter white circular area with an approximately 2.5 cm black edge border, and two 10 cm lines on the center. The two lines are not expected or supposed to be recognized by some sensors.
- Sumo ring constructed with approximately 1 cm thick plywood, non-magnetic material.
- The Sumo ring is to be elevated by approximately 3 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.
- The starting lines are printed on the center of the Sumo ring. The robots must always be located facing each other. The robots don't beyond the line.
- Once the robot has been fixed, it cannot be moved anymore.



●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. The team which intentionally does that is eliminated for the match, and opponent team gets 100 scores.

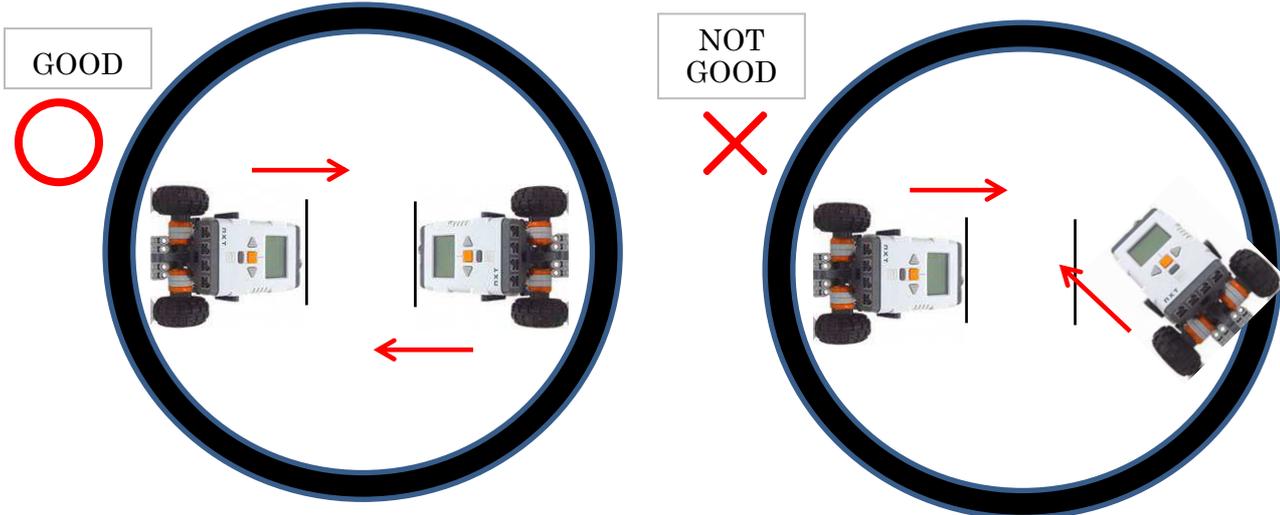
●General Rules of Play during Sumo Heat:

1. During the qualifying period there is no seeding, simply go to any ring to find an opponent.
2. Run as many Sumo as you are ready during the qualification period (all teams need 5 qualifying scores, your 5 highest qualifying scores, determine who gets into the tournament).
3. The teams have 1 minute for the heat, and start to move their robots by judge's cue.
4. Only Players can operate and manipulate the robot during the heat (Players play, Coaches coach.)
5. Each team competes on a Sumo ring with a robot that they have constructed themselves to the specifications listed within this document.
6. The robots must always be located in two reciprocal sectors, separated by the starting cross. It is not allowed that robot beyond over the starting cross, even if part of the robot.
7. If 1 minute passes with no decision or both of their robots stop moving during within 1 minute, judge stops the heat which is considered a DRAW. No points are awarded to either them. If DRAWs are repeated again and again, both teams relinquish the ring to the teams waiting to Sumo.
8. The ring judge's decisions are final, they determine the winner of the match. Sumobots pushed off the edge of the Sumo ring area eliminated for that match.
9. If both robots fall, the last robot to hit the floor, as determined by the ring official, will be awarded the point.

●Scoring:

- Full score is awarded ONLY if you push your opponent off during 0-19 seconds from start. If you have more time to get decision, the score you get decreases. **See matrix below.**
- Higher scores are earned by pushing your opponent off earlier from start.

● **Starting the Play of Sumo Heat:**



● **Scoring Matrix:**

	The time to push off the opponent from start			
	0 – 19 seconds	20 – 39 seconds	40 – 59 seconds	over 60 seconds
Score	300	200	100	NA

● **Tournament Scoring:**

- The top eight 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 2017” 8 Team Tournament Bracket

Tournament Placing

- The losing teams from Round 1 will place 5th through 8th 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 3rd and 4th place winners respectively.
- The winning teams from Round 2 will face each other in the Championship Round (which may be run at the same time as Round 3) to determine the 2nd place winner, and the Tournament Champion.

