4. SumoBot Challenge

4.1 Goal

To design, build, and program an autonomous robot that can push opponent sumo robot off an elevated wrestling ring.

4.2 Division

- Teams in this challenge compete in separate divisions:
  - Elementary School (ES)
  - Middle School (MS)
  - High School (HS)
- Teams of 2 to 4 players

4.3 ROBOT

- Autonomous robot, any platform, costing $1,500 USD or less, that meets the following design constraints.

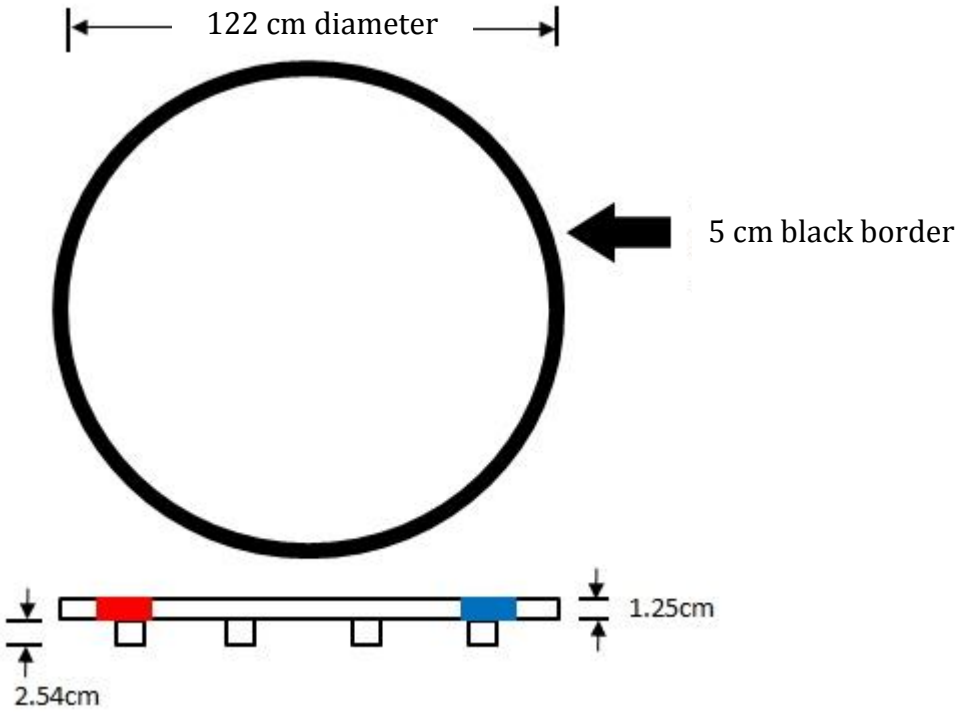
Type	Specifics
Robot platform	No limitations except for sharp edges
Type	Autonomous robot
Volume	Base area equal to OR less than 400 square cm. No limit on height.
MAX Mass	1.5 Kg
Multiple Controller	Allowed
Sensor type	Not limited
Sensor number	Not limited
Motor type	Not limited
Motor / # of Servos	Not limited

Robot restrictions:

- NOT allowed:
  - Sharp edges. (if you can cut yourself on that blade NO GO!)
  - Parts that could break or damage the ring or the other robot (For example: scratches, cut, and drilling). Normal pushes and bangs are not considered a robot's intent to damage.
  - Jamming devices, such as IR LEDs, intended to saturate the opponent's IR sensors.
  - Devices that can store liquid, powder, gas or other substances for throwing at the opponent.
  - Flammable materials.
  - Casting object intended to strap opponent's robot.
  - Systems to increase down force such as a vacuum pumps and/or magnets, glue, suction cup.
  - Sticky substances to improve traction.
  - Sharp claw fix robot on ground.

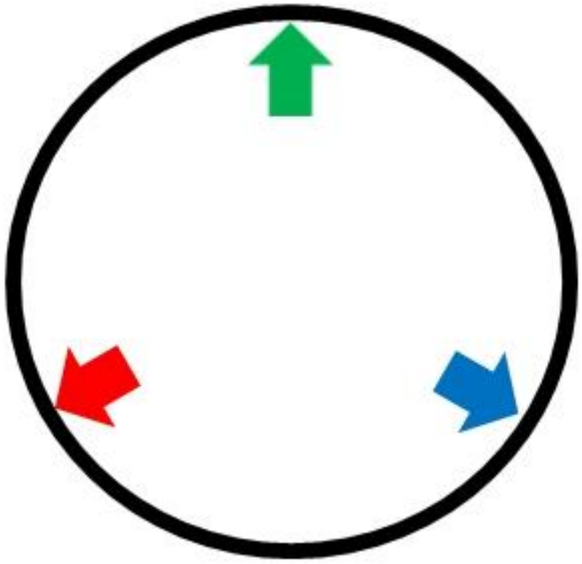
4.4 Ring specifications

- Approximately 122 cm-diameter white circular area with a 5 cm black edge borde.
- Sumo ring constructed with 1.25 cm thick plywood or other suitable non-magnetic material.
- The Sumo ring is to be elevated by2.5 cm by various supporting block attached to the bottom of the Sumo ring. Supporting structures must be at least 1 cm from the top edge of the Sumo ring.
- Red, blue and green colors are attached to the side of the Sumo ring as a mark of the start position.



4.5 Rules and Scoring

- You will get 25 official scored runs during the challenge scoring period.
- The total of your 10 highest official scores are used to determine tournament selection. The top 9 teams will move on into the challenge tournament.
- Match procedure :
  - During the scoring period teams report to the judges table and check in, and then are told which ring to go to for the match.
  - Only one team member may sit at ringside and start the robot, other team members need to be behind them in support of their SumoBot.



- Upon the judge's instructions, teams will center their SumoBot on one of the colored edges facing outboard (No color arrow on actual sumo ring).
- SumoBots must be placed near the edge so that their SumoBot breaks the plane of the inside edge of the black line.
- Sumo match stops at 1 minute OR when there is ONLY one robot on the sumo ring.

- There is no TIME bonus in SumoBot Challenge.
- In principle, Sumo match will be performed with 3 robots unless it is avoidable.
- In a match that starts with three SumoBots, if only one SumoBot is left AND NO time remains, then 3 points is awarded to the winner and a score of 0 is assigned to the losing teams.
- If only two robots play on the sumo ring, the winner robot gets 2 points, if they are the last robot and NO time remains.
- A team that defeats a team with more than 10 won records are rewarded by 2 extra bonus points. A team that defeats a team with more than 15 won records are rewarded by 3 extra bonus points.
- 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 5 seconds
- If it is unclear whether progress is being made or not, the judge can extend the time limit for observable progress to up to 15 seconds.

3 Robot Scoring Possibilities:

- If robot A is pushed off on the ring by robot B, and robot B is pushed off by robot C, then robot A and B get 0 point, robot C gets 3 points.
- If robot B is pushed off the ring by robot A, and robot A and C stay on the ring through 1 minute, robot B gets 0 point, robot A and C get 1 point (standing as time ends).
- If robot C are pushed off by robot A & B, then robot A and B stay on the ring through 1 minute, robot C gets 0 point, robot A and B get 1 point.

4.6 CHECK IN

- Robot will be verified at the check-in-desk before each match.
  - The robot conforms to the specifications.
  - Base of the robot must not exceed 400 cm2, with no limit on height.
  - Mass of the robot must NOT exceed 1.5 kg.

4.7 TOUNAMENT SCORING

- The top 9 teams from each division will compete in the final tournament.
- Teams got same score in the top 9, decision match will be.
- Advancing teams will be seeded into the tournament bracket according to their aggregate score (see bracket below).

"RoboRAVE Kaga Japan 2019" 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 5rd and 6th place winners respectively.

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