

Valid until  
9.30.2022



## SUMO Challenge Rules

### Goal

Design, build, and program an autonomous robot that can search for and push an opponent sumo robot off an elevated wrestling ring.

### Who Can Play

Teams in this challenge compete in divisions based on the mass of your robot.

- 1) Elementary School (ES) - 1 Kg, Lego 1 Kg
- 2) Middle School (MS) - 1 Kg, 3 Kg, Lego 1 Kg
- 3) High School (HS) - 1 Kg, 3 Kg, Lego 1 Kg
- 4) University/Professional (UP) - 3 Kg

1Kg	3Kg	Lego Only 1Kg (Optional)
ES	**	ES
MS	MS	MS
HS	HS	HS
**	UP	**

\*\* These categories could be added at the Event Directors discretion

### Requirements

- 1) An autonomous robot  $\leq$  to the category mass either for physical or streaming challenges.
- 2) This event is NOT offered in RoboSensei (virtual challenges).
- 3) Teams:
  - a) @ physical events are 2- 4 players
  - b) @ streaming events are 1-4 players

### General Rules

**Robot:** Autonomous robot, any platform, costing \$1,500 USD or less, and meeting the following design constraints, which will be verified during Robot Check-In.

- 1) Maximum size of robot in starting position is 25cm by 18cm with no height restriction
- 2) Robot may open larger once in operation, provided prior judge approval upon seeing the fully deployed design meets all applicable rules.
- 3) Teams can Practice on open tracks, taking turns with other teams needing to practice.
- 4) Robots begin by touching the white line at opposite sides of the table from each other, positioned in any orientation. The robots must pause for 3 seconds after the start buttons are pressed to allow the team member to back away from the ring.
- 5) The loser is the robot that leaves the ring first, which is defined as touching the surface upon which the competition ring is placed. The referee may call a draw after 60 seconds or force a restart after 5 seconds of "locked robots" at their discretion.

- 6) Robot handlers must not touch their robots unless instructed by the referee. 5 minutes is allocated per match, if there is no winner in this time then it will be classed as a draw.
- 7) Conflict Resolution - during game play, the referee's decisions will be final.

### **Challenge Specific Rules**

- 1) Articulating or moving components are allowed as long as they fit the above design rules however the no intentional harm rule applies - this means that flippers and skid plates are fine but deliberately destructive mechanisms such as abrasive spinners or hammers etc. are not allowed.
- 2) Beginning length & width, and operational size will be strictly enforced throughout the event
- 3) Before each round, each participating robot must be remeasured for total mass

### **For Lego Only Option:**

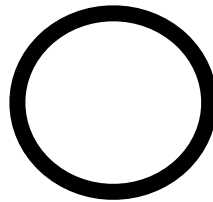
- 1) Any LEGO robot can be used, total value  $\leq$  1500 USD
- 2) It must be 100% LEGO branded parts
- 3) It must be autonomous
- 4) It must conform to the design specifications
- 5) It must conform to all applicable rules

### **Track - Dohyo Ring:**

#### **Physical events:**

- 1) 100cm diameter white circle with a surrounding 5cm black border by ~13 to 20 mm thick board.

100 cm diameter White interior with a

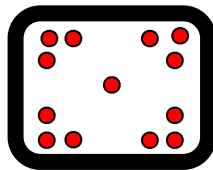


- 2) The surface of the ring should be elevated ~50 to 80 mm off the ground. (measurements will vary slightly based on local materials being used)
- 3) Free of tire marks as possible (recommended: clean the dohyo after each round - have 1-2 extra dohyos for if needed)

### **Streaming events:**

- 1) The track is printed (from a file provided for the challenge) in separate sheets (A4 or 8.5" x 11")
- 2) Assembly instructions are provided with the challenge file provided to registered teams (tape required)
- 3) The shape is NOT circular but rectangular with rounded corners

Sample Streaming Sumo Challenge with red cup opponents



## Virtual events:

Currently NOT offered on RoboSensei

## Scoring

### Challenge Scoring

#### @ Physical events

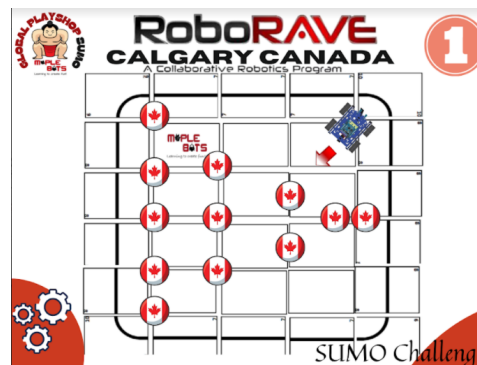
- 1) Each robot will compete in a series of round robin matches. The number of rounds/matches will be determined on the day of competition based upon the time permitted and the number of robots in each category.
- 2) A match will be over once
  - a) a team has won twice against their opponent
    - i) 3 points awarded for a win,
    - ii) 1 point for a draw and 0 points for a loss.
- 3) Teams' points will be tallied and displayed during the competition.
- 4) The top 8 teams in each category will be selected for the finals matches.

#### @ Streaming events

- 1) Two minutes to clear the 'opponents' completely outside the black border surrounding the Dohyo area
  - a) Cup size is approximately 295 ml



cup pattern on an example track



- 2) "Opponents" are empty plastic cups upside down, inside the Dohyo area, in pre-selected positions
  - a) Out of Dohyo, points scored
  - b) Inside or on the line  
NO points scored



Red Cup:  
OUT and scored;



Green Cup:  
ON the line, NO score

## Tournament Scoring:

- 1) Typically tournaments are for the top 8 teams.
  - a) However, should there be more than 8 teams due to ties, the event director can increase the tournament size to 12 or 16, or
  - b) can hold a tie breaker tournament to get to 8, 12, or 16 teams to host a tournament.
- 2) Each round will consist of up to 2 minutes to complete
- 3) One round per tournament team will be provided
- 4) Advancing teams will be seeded into the tournament bracket according to their overall score. Below is an example of our typical 8 team tournament bracket.
- 5) Runner Up is used to determine 3<sup>rd</sup> & 4<sup>th</sup> places based on the outcome of semi-finals.

