




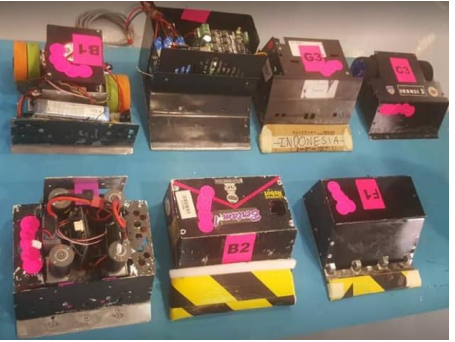
RoboChallenge

MRSM 2023

Autonomous Sumo

Robot Rules

AUTONOMOUS SUMO ROBOCHALLENGE	
Age	13-17
Team	2 Person / Team
Robot Kits	Open Kits
Mission	Participants are required to build an autonomous, self-contained mobile robot that can push its opponent out of the specified area according to the tournament rules.
Robot Building	Pre-Build
Game Method	Battle 1 vs 1

1. Objective

Participants are required to build an autonomous, self-contained mobile robot that can push its opponent out of the specified ring according to the tournament rules. Robot handlers are to start the robot wireless via remote control with the press of a single button or press of a single button at the robot.

Team Structure: This game is taken as Standard Category. Each team consists of one (1) instructor that can enter the game field during a match.

2. Robot Specifications

2.1 Dimensions and Weight

2.1.1 The full extension size of the robots shall NOT exceed **20.0 cm** (Length) x **20.0cm** (Width). There is no height restriction, and it may take any shape and size once the match begins.

2.1.2 The weight of the robot shall NOT exceed **3.0kg**.

2.2 Restriction on the Robot Design

- 2.2.1 Robots shall NOT employ any active weapon. Projectile weapons or sawblades are prohibited.
- 2.2.2 Robots shall NOT damage the arena deliberately.
- 2.2.3 Robots shall NOT throw liquid or powder or other substances at the opponent.
- 2.2.4 Robots should NOT secure itself on the ring surface by using, suction cups, diaphragms, sticky treads, glue or other such devices.
- 2.2.5 The robot is powered with **NOT greater than 24V** by single or combination of battery.
- 2.2.6 The robot has no restriction on the structure used, it shall be using ANY microcontroller as the core processor of the robot.

2.3 Control Method

- 2.3.1 The robot shall be autonomous. No external form of control or any external intervention is allowed.
- 2.3.2 The Robot shall be started with remote control with the press of a single button or press of a single button at the robot.

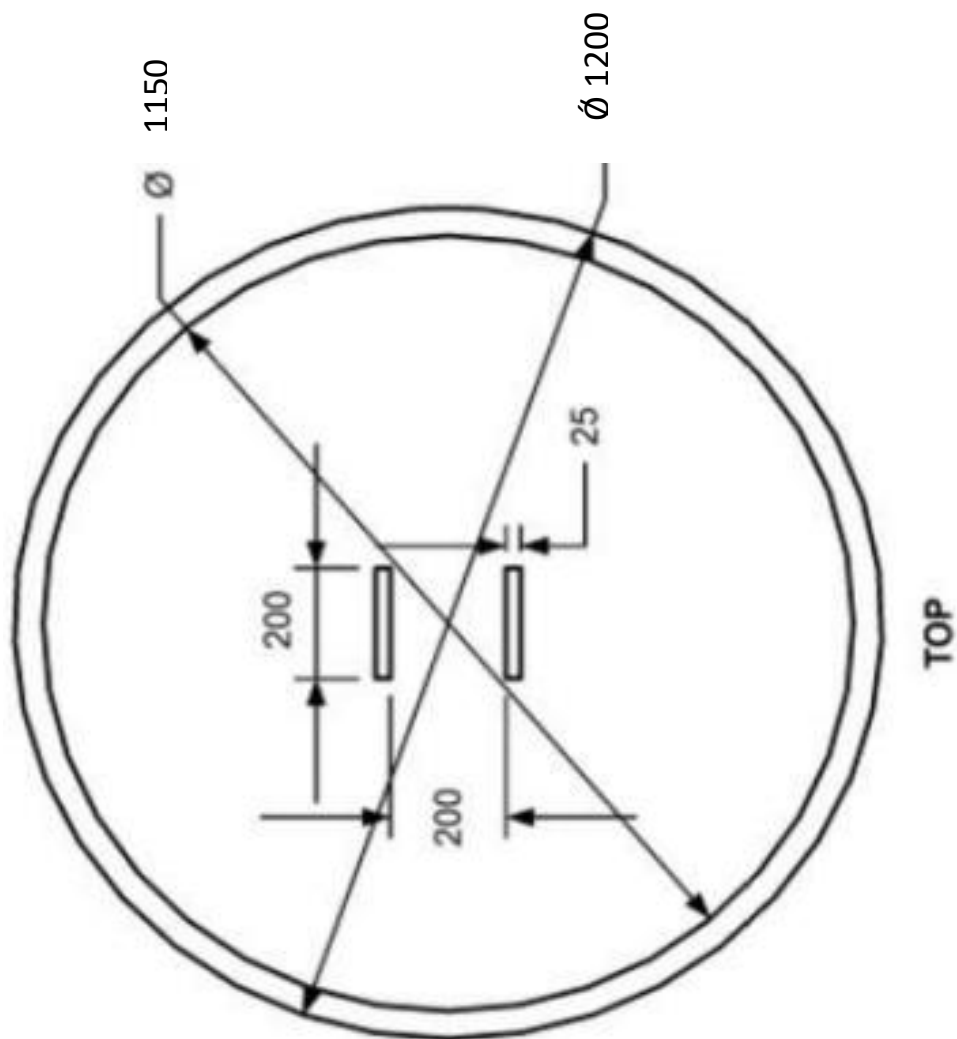
3. Ring Specifications

3.1 Dimensions and Materials

- 3.1.1 The ring arena is made of a 15mm thick plywood. The diameter on the ring is 1200mm including the boundary marking.

3.2 Markings

- 3.2.1 Two dark colour starting lines (200mm x 25mm) locate at 200mm apart at the centre. They indicate the starting positions for two competing robots.
- 3.2.2 The boundary of the ring arena is marked in white colour. The width is 50mm.



3.3 Ring Condition

- 3.3.1 The ring condition may vary slightly, and participants should design and build their robots with robustness in mind.

4. Games Rules

4.1 Games format

- 4.1.1 The robot which pushes the opponent robot off the playfield or the opponent out itself from the game field will be considered winner.
- 4.1.2 Each match will use the best of three (3) format where the winning team of two games (1st match and 2nd match) considered the winner. If the result is draw there will be a 3rd match.
- 4.1.3 If both robots are stuck together more than 10 seconds and show no progress, rematch will be carried out. If the same problem occurs, the lighter robot will be declared as a winner.
- 4.1.4 In case of the robot's body is out from the game field more than half or unable to return back into the game field, it is considered as loser.

4.2 Starting Point

- 4.2.1 Each robot must be place behind the starting line (dark line).
- 4.2.2 Robots are to remain stationary until the START whistle is blown.
- 4.2.3 Robot **MUST HAVE 5 Second** delay once start button is pressed. If robot there is no delay that robot will be DISQUALIFIED.
- 4.2.4 Robot position is as described:
 - In the 1st match, 2nd match and 3rd match robot must face each other. The position of robot is free to place as long as behind starting lines and facing the opponent.

Robot position before match



4.3 Service Time

- 4.3.1 Participants will be given 60 second of Servicing-Time before the start of each matches in a game. No robot change are allowed. Only replacement of identical parts and batteries are allowed.
- 4.3.2 Any team that fails to complete the robot setup within 60 second will be DISQUALIFIED from the match.

4.4 Time Out & Retry

- 4.4.1 No time out and retry is allowed.

4.5. Robot Handler

- 4.5.1 A participant is allowed to handle only one same robot throughout the event. (No sharing of robots is allowed). The handler and robot will be identified during registration.

5.0 Tournament Format

- 5.1.1 The tournament will be based on **Double Knock Out Tournament Format**.

The **Double Knock Out Tournament Format** also known as *Double Elimination*, is a format for pairing players to play games in tournaments. Unlike *single knockout*, where players are eliminated immediately upon losing any game, in double knockout players are eliminated only after losing two matches.

- 5.1.2 Game format may be vary depending on the number of the competing teams.
- 5.1.3 The match draw will be done shortly before the match start.

6. Others

- 6.1 The allowable margin of error to the game field in this Rulebook wherever not mentioned is $\pm 5\%$ in size.
- 6.2 For any other behaviour not specified in the rules, referees are given FULL authority to make the decision and the decision is final in the event of a dispute.
- 6.3 Any amendments to these rules will be announced by the Organizer and be updated on MRSM Bentong Website.
- 6.4 Any further question please contact MRTC:

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