

Regulation 1.

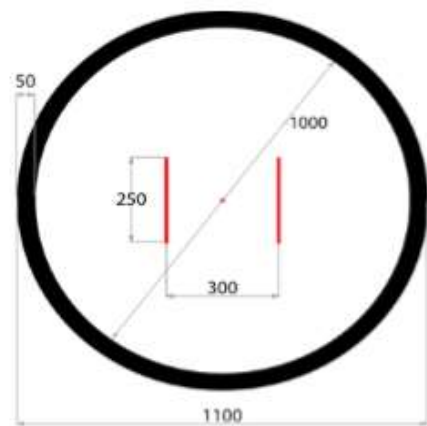
Competition rules of “ROBO SUMO”

1 CONDITIONS OF COMPETITION

- 1.1 To participate in the “Robo Sumo” robots competition, participants need to prepare an autonomous robot that is capable of pushing the enemy robot most effectively out of the circle, outlining the ring - beyond the black line of the ring.
- 1.2 The competition takes place between two robots.
- 1.3 The duration of the round is 1 minute.

2 RING

- 2.1 Ring is white matt.
- 2.2 Ring diameter - 1 m (white circle).
- 2.3 The bounding line is black matt.
- 2.4 The width of the bounding line is 50 mm.
- 2.5 The red dot marks the center of the circle.
- 2.6 In the center of the circle the starting zones of the robots are marked with red stripes.
- 2.7 The minimum free space or outer zone of the ring (Around the ring should be free space. It can be of any color, shape, of any material, if the basic fundamentals of these rules are not violated. This space with the ring in the center will be called the “ring zone”. Markings or parts of a platform with a ring that extend beyond the minimum sections will also be considered in the ring zone.) - 50 cm.



3 ROBOT

- 3.1 The robot must be autonomous.
- 3.2 The maximum width of the robot - 20 cm.
- 3.3 Maximum length –20 cm.
- 3.4 Maximum height –20 cm.
- 3.5 The weight of the robot should not exceed 1 kg (including batteries).
- 3.6 Participants can use any kind of material to build a robot.
- 3.7 Only one controller is allowed in the robot design.
- 3.8 Valid Software: ANY.
- 3.9 During the match, the size of the robot may vary, but not more than 15 cm. The weight of the robot must remain unchanged.

3.10 The robot should start moving after a 5-second delay from the moment of launch.

3.11 Construction restrictions:

- It is forbidden to use in the construction of the robot any components that may in one degree or another damage the surface of the ring;
- It is forbidden to use materials, parts and components that imply a deliberate destructive effect in the design or appearance of rival robots;
- It is forbidden to use any adhesive devices on the wheels and the body of the robot;
- It is forbidden to use any lubricants on the exposed surfaces of the robot;
- It is forbidden to use any devices that give the robot increased stability, for example, creating a vacuum environment;
- It is forbidden to interference with the infrared and other sensors of the opposing robot as well as interference with electronic equipment;
- It is forbidden to use devices that throw anything into the opponent robot;
- It is forbidden to use liquid, powder and gas substances as a weapon against a rival robot;
- It is forbidden to use any flammable substances as a weapon.

Robots that violate the above prohibitions would be removed from the competition.

3.12 Before the beginning of the matches, there will be the technical examination of robots in accordance with the specified parameters.

4 CONDUCTING COMPETITIONS

4.1 “Robo Sumo” robots competition consists of matches. Each match consists of three rounds.

4.2 At the first stage, teams are divided into groups by drawing lots, three, four or five each, depending on the number of participants. In the group stage, each team conducts a match against each team in its group. The teams that took the first and second places, respectively, are in the PLAY-OFF.

4.2.1 PLAY-OFF:

At this stage, matches are held in lost-left basis, i.e., a losing team leaves the competition. The number of matches depends on the number of teams.

4.3 Each of the 3 rounds is different from the way of placing robots at the start:

1st round - face-to-face placement (Figure 1);

2nd round - side position of robots (Figure 2);

3rd round - reverse position of robots (Figure 3).

The method of placement is determined by the judge during the competition.

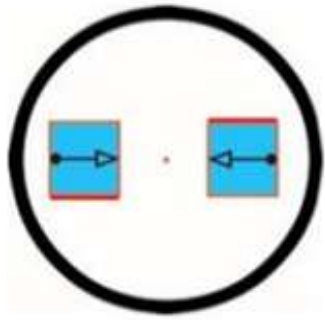


Figure 1

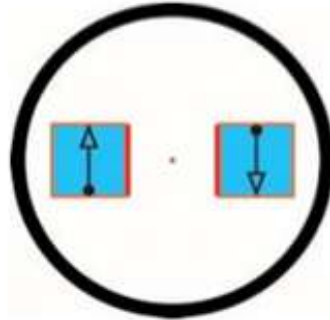


Figure 2

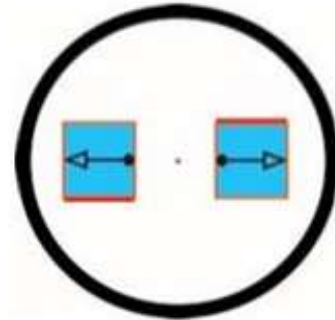


Figure 3

- 4.4 To hold the match robots are divided into pairs. The round determines the strongest robot of the pair, i.e. the robot, which pushed the opponent out of the circle, limited by the black line, for the allotted time. In each round, both robots can make no more than 2 attempts. An attempt is to move the opposing robot around the ring in order to push the opponent out of the ring (beyond the black limit line).
- 4.5 A second attempt is provided only in the following cases:
- when the robots could not finish the round due to outside interference;
 - when a malfunction has occurred due to the poor state of the playing field;
 - due to a mistake made by the panel of judges;
 - if both robot are inactive for 10 seconds after the Start command is given.
- 4.6 Between rounds, participants have the right to promptly change the design of the robot (including repairs, battery replacement, program selection, etc.) if the changes made do not contradict the requirements for the design of the robot and do not violate the competition regulations. Time for operational constructive change of the robot is 5 minutes. Time is monitored by a technical commission judge.
- 4.7 Prior to the start of the match, competitors must place their robots in the "quarantine" area. After confirmation by the technical commission judge that the robots meet all requirements, competitions can be started.
- 4.8 If, during the technical examination of the robot, violations in the design of the robot are detected, then the operator is given 3 minutes to eliminate them. If violations are not eliminated during this time, the robot will not be able to participate in the current match.
- 4.9 Launch procedure
- 1) Before the start of each match, the judges of the technical commission confirm that the robots meet all technical requirements and competitions can be started;
 - 2) After the judge announces the start of the round, the robots are set by operators to the starting position, in accordance with paragraph 4.3;
 - 3) After the "Start" command, operators launch robots;

- 4) After starting the robots, operators must move more than 1 meter away from the field within 5 seconds.
- 4.10 During an attempt, competitors must not touch the robots or the ring. It is forbidden to remote control or supply any commands to robots.
- 4.11 An attempt is considered complete if:
 - any part of the robot (wheels or parts of the robot that touch the ring) touched the area behind the black bounding line of the ring;
 - the round time has expired (1 minute).

5 JUDGING

- 5.1 The Organizing Committee reserves the right to make any changes to the rules of the competition, if these changes do not give advantages to one of the teams.
- 5.2 Monitoring and summarizing is carried out by the panel of judges in accordance with the rules.
- 5.3 Judges have full authority throughout the competition. All participants must comply with their decisions.
- 5.4 The judge may schedule additional rounds to clarify issues.
- 5.5 By decision of the judge, the round may be suspended to clarify the rules.
- 5.6 If there are any objections regarding refereeing, the team leader has the right to appeal in writing to the decision of the judges in the Organizing Committee no later than 10 minutes after the end of the current round.
- 5.7 The referee may end the round at his own discretion if both robots fail to proceed within 10 seconds.
- 5.8 The list of violations leading to the warning:
 - if, during the round, someone from the team other than the operator touched the robot;
 - if someone from the team touched the opponent's robot during the round.
- 5.9 When the team receives the first warning, the current round is replayed. When a team receives a second warning, the round stops and the team robot is considered the loser in the current round. The team that received 3 warnings during the competition is disqualified for the entire duration of the competition.
- 5.10 The list of violations leading to the immediate disqualification of the team for the entire competition:
 - if someone remotely controls a team robot during a round;
 - if robot intentionally interferes with the opponent robot.
- 5.11 In disputable situations, the decision on winning or holding an additional round is made by the judge of the competition.

- 5.12 The contact of participants with the panel of judges should be kept to a minimum throughout the entire duration of the competition and, if possible, be limited to only regulated interaction in order to eliminate unlawful situations.

6 RULES FOR SUMMARIZING

- 6.1 The winner in the round is the team whose robot is closer to the center of the ring at the end of the round.
- 6.2 The results of the group stage are defined as follows: the team plays a match against each team in its group. Each match consists of 3 rounds. For each winning round the team gets 1 point. If in the match team A wins 2 rounds and team B wins 1 round, team A will receive 2 points, and team B will receive 1 point. This way, teams collect points. The first 2 teams with the highest points in each group are eligible for PLAY-OFF. If necessary, the team ranked third with the most points can also be selected to participate in the PLAY-OFF.
- 6.3 PLAY-OFF continues until 4 teams remain. Next matches are called as semi-finals.
- 6.4 The team that won the final match becomes the winner. Its last opponent gets second place. To determine the third place, an additional match is held between the two teams that lost in the semi-finals.