"INTELLECTUAL SUMO A"
ROBOTS CONTEST ORDER

Age of participants: 10-14 years.

Team: 2 participants.

Robots: autonomous robots.

Equipment: LEGO MINDSTORM

Programming language: Labview, Robolab, RobotC

Procedure for the conduct of competitions: in a circular, according to the draw, in parallel on 2 tables.

1. Introduction
"INTELLECTUALSUMO" order of the contest is based on the rules of the European sumo RobotChallenge games. The objective of these rules is to facilitate the participants’ taking part in international sumo contests.

The main difference from RobotChallenge rules:
1.1. One match shall consist of 3 rounds, 90 seconds each (RobotChallenge lasts for 3 minutes).
1.2. In this contest the existence of the IR-start system in the robot is not necessary (but not excluded). Potential participants of European RobotChallenge contests should take care of its installation in the future.
1.3. There is separate A class for Lego-robots.

2. Requirements for Robots
2.1. Dimensions (width x length) at the start time are 150x150mm, height shall not be regulated.
2.2. The robot after the start signal can change its size, but not more than 15 cm. At the same time, it must remain a single whole. The weight of the robot must remain unchanged.
2.3. The total mass of a robot shall not exceed 1000g.
2.4. Tires of a robot shall not have sticky substances on them. In contact with the testA4 piece of paper, a robot shall not be able to pick it up and pull it along.
2.5. A robot shall be fully self-contained, control from the outside (by an operator or by an OS of a PC) is prohibited.
2.6. An operator shall receive a RIN (Robot Identification Number) at registration and shall display it on a visible part of a robot before directing it to quarantine.
2.7. The robot must contain a distance sensor (ultrasonic).
2.8. Additional requirements for robots:
2.8.1. Jamming devices intended to saturate the opponents sensors, are not allowed.
2.8.2. Parts that could damage the ring, the opponent’s robot or it's operator are not allowed.
2.8.3. Construction of a robot shall not contain liquid, powder, gas or flaming substances.
2.8.4. During the match, when little destruction of a robot due to the implementation of the contest task, it shall not be stopped. In case of significant damage (total mass of the parts dropped out of a robot is more than 500mg), the victory shall be awarded to the opponent.
2.8.5. Devices to increase down force, such as a vacuum pump or magnets, are not allowed.

3. Requirements for the Ring
3.1. The ring shall be a matted black circle of 77cm in diameter and of 16-25mm height.
3.2. The ring shall have a white border of 20-25mm width along the perimeter.
3.3. The center of the ring is marked with a red circle with a diameter of 10 mm.
3.4. Outside the outer edge of the ring, there should be free space of at least 50cm (in all the sizes ±5% is allowably).

4. The Rules of the Matches
4.1. The objective, according to the sumo rules, is to push a robot-opponent from the arena using a self-contained robot built by a team.
4.2. Before the start of the competition, depending on the number of teams declared, participants will be divided into groups / subgroups by means of the draw.
4.3. Before a match starts, operators shall place their robots in the ring according to the order of robots arrangement (p. 5)
4.4. Upon the judges’ command, operators shall turn on power and leave the ringside area within 5 seconds after which the robots autonomously shall start moving towards each other until they contact and shall not separate until the end of the match.
4.5. The first robot to touch the surface out of the ring or / and lose contact with the opponent and the ability to move (e.g., rollover), shall be a loser, and its opponent shall score 1 point.
4.6. If a robot obviously leaves the line of attack and avoids contact with an opponent, it shall be defeated (its opponent scores 1 point). An exception is when the contact is lost as a consequence of the fight.
4.7. If both robots have lost contact and the ability to move, the match shall be stopped.
4.8. After 90 seconds, the victory shall be awarded to the robot which is located closer to the center of the ring (1 point).
4.9. A robot shall lose automatically if an operator touches it after the start signal from the judge.
4.10. If it is impossible to determine the winner at the end of a match, the judge may declare a draw or assign a replay.
4.11. Not more than 3 duels shall be held between a pair of teams.
4.12. The team that received the maximum score in their group / subgroup goes to the next round. With an equal number of points, teams may have an additional duel.
4.13. The match shall end when the judge announces so, after that an operator shall retrieve the robot from the ring area.

5. The Order of Robots in the Ring before the Fight
5.1.1. On the judge's signal, a pair of competing teams shall come up to the ring.
5.1.2. Position of a robot in the ring shall be by drawing of lots, after which an operator puts their robot according to the draw (see Fig. 1) in a particular quadrant appointed by the judge.
5.1.3. Robots can be located only in the opposite quadrants.
5.1.4. After placement is over, operators cannot move their robots.

Fig. 1. Position of the robot in the ring

Face to the competitor  Left side  Right side  Back to the competitor

Fig. 2. Example of two robots placing
6. Points
6.1. Points shall be awarded to a team upon the judge’s decision in accordance with the contest rules (p. 4)
6.2. In determining of the winner, the judge shall take into account the following factors:
   6.2.1. Technical efficiency of actions of a robot
   6.2.2. Team’s behavior
   6.2.3. Fines and penalties
6.3. A match shall be stopped and resumed in the following cases:
   6.3.1. If it is impossible to determine the winner, ineffective technical hitch or both robots avoid the fight for 5 seconds. Observing the behavior can be extended up to 30 seconds, after which the judge stops the match and assigns a rematch.
   6.3.1.1 Avoiding the fight is:
      • If robots do not attack each other, but continue moving for 5 seconds.
      • If one of the robots stops and stays stopped for 5 seconds, showing no attacking activity.
   6.3.2 In the case of simultaneous touch the surface outside the ring by both robots, the judge stops the match and appoints a rematch.
6.4. Other reasons for a match being stopped:
   6.4.1. A player can request to stop the game when they are injured or their robot had an accident and the game cannot continue. The team whose actions are the cause of such injury or accident shall lose the match. When it is not clear which team is such a cause, the team who requests to stop the game, shall be declared as the loser.
   6.4.2. To handle an injury or an accident, a decision on rehabilitation shall be made by the judges and the Organizing Committee members. The decision process shall take no longer than five minutes.
   6.4.3. The judges' decisions are not to be discussed, the objections are not to be declared.
   6.4.4. The appeal is presented to the Organizing Committee before the end of this type of contest. In the absence of representatives of the Organizing Committee, the appeal is presented to the judge of the contest.

7. Requirements for Robot Operators
7.1. The teams whose players’ age category complies with the Regulations shall be allowed to participate in this contest.
7.2. Possible Penalties
   7.2.1. A manifestation of disrespect to the judge and / or the opponent, expressed in writing, orally or otherwise is considered to be a violation. In case of abusive behavior, the first warnings hall be issued, if the behavior is repeated, the judge shall issue a fine (1 point, etc.)
7.2.2. Team’s members’ actions that disturb the progress of the contest (-0.5 points):

7.2.2.1. An operator is in the ring area during the match without the permission of the judge.
7.2.2.2. An operator or a team leader demands to stop the match without appropriate reasons.
7.2.2.2. Placing foreign objects in the ring.
7.2.2.3. Preparation of a robot for more than 30 seconds before the start of the match after the judge’s signal.
7.2.2.4. Start operating the robot within five seconds after the judge announces the start of the match.
7.2.2.5. When the judge sees a team's actions cast doubt on the integrity of the match, they are rebuked (-1 point), after the second rebuke, the team shall be disqualified and removed from the contest.

7.2.3. Each violation is fixed in the score sheet, at the end of the match the other team gets the penalty points added from the opponent, and then the winner is declared.

**CONTEST ORDER FLEXIBILITY**

1. The flexibility of the rules can be manifested with changes in the number of participants in the competition, which may have a minor effect on the content of the regulations, but at the same time, its basic concepts must be observed.
2. Contest organizers may make changes or exceptions to the order before the event, after which they shall be constant throughout the event.
3. Participants shall be informed about changes or cancellation of the contest order in advance (no later than 15 minutes) prior to the contest.
4. Adjusted rules shall remain unchanged during the contest.

**LIABILITY**

1. Teams and competitors are personally responsible for the operability and safety of the robots, as well as they are responsible in accordance with the legislation of the Republic of Kazakhstan for any accidents caused by the actions of team members or their robots.

2. The organizers are not liable in the case of an accident or an emergency caused by the actions of team members or their equipment.

**LINKS TO THE RESOURCES USED**

1. [www.robofinist.ru](http://www.robofinist.ru)
2. [www.myROBOT.ru](http://www.myROBOT.ru)
3. [robolymp.ru](http://robolymp.ru)
4. [www.rus-robots.ru](http://www.rus-robots.ru)