Annex to the Regulations for the VI International Festival of Robotics, Programming and Innovation Technologies "RoboLand 2021".

MAZE OF CONTROLLED ROBOTS

Age of participants: 8-10 years old.
Team: 2 people.
Robots: robots controlled by a remote control, assembled and programmed by a command.
Used equipment: WeDo 2.0 LEGO Educatoin и RoboKit RoboRobo.
A programming language: at the discretion of the team, no restrictions.
Competition order: one by one, according to the drawing.

Purpose of the game:

1. Assembling and programming the robot driven by the remote control.
2. Maze performance by controlled robot from the Start to the Finish point.
3. Delivery of artifacts located in the maze to the Finish area.

1. Playing field

1.1. Description

1.1.1 The playing field is built on a modular principle of plates that can be used to create an infinite number of different variants of the robot's movement.
1.1.2 The field is built from 300*300mm plates. The wall height of the maze is no more than 300mm. The final variant of the path remains unknown until the competition day. The plates are laid on a solid base of any thickness.
1.1.3. Maximum number of plates on the field - 20 pcs.
1.1.4. The start area is highlighted in green. The finish area is painted red.
1.1.5 The colour of the field surface is white or close to white. The surface may be either smooth or textured, and may have irregularities up to 3mm at the plates' contact points.

1.2. Artifacts

1.2.1 A figure assembled from LEGO cubes. Base size 4 x 4 modules. Height is 4 cubes. (Fig. 1)

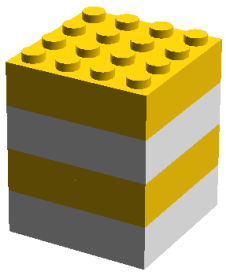

Figure 1. Artifact
1.2.2 Number of artifacts in the race is no more than 3.

2. Robots

2.1 Construction

2.1.1 Constructions WeDo 2.0 LEGO Educatoin and RoboKit RoboRobo can be used to build the robot. The number of sets used to pass the task is not limited. That is, the team is allowed to use 2-3 sets WeDo 2.0 LEGO Educatoin and RoboKit RoboRobo.
2.1.2. The size of the robot is not limited. The weight of the robot is not limited. On the day of the competition the robot must be in its assembled form.
2.1.3 In addition to the robot moving in a maze, competitors must assemble a remote control. The remote control is assembled and programmed by competitors on the day of the competition. In the WeDo 2.0 the remote control can be a laptop.
2.1.4. The laptop will be checked by the referee for the presence/absence of ready-made software code.
2.1.5. Robots shall not cause damage to the playing field.

2.2 Control

2.2.1 The robots must be driven by the programmed remote control.
2.2.2 Communication between the robot and the remote control is only possible via the wireless report.

2.3 Inspection

2.3.1 It is the duty of the team to check the robot before the performance.
2.3.2 Before the competition, the robots are checked for compliance with the declared requirements and quarantined.
2.3.3 Team members may be asked how their robot works.
2.3.4 All teams shall provide their program codes before the competition.

2.4 Violations

2.4.1 Any violations detected during the inspection shall prohibit the robot from participating in the competition until eliminated.
2.4.2 Removal of violations shall be made within the time frame determined by the competition schedule, teams shall not delay the tournament.
2.4.3 If the robot does not meet the requirements even after the modifications, it is exempted from the tournament but not removed from the tournament.
2.4.4 Participation of coaches and other adults is not allowed.

3. Competitions

3.1. Competition area

3.1.1 The space around the main playing fields is designated as the competition area.

3.1.2 Teams must choose from their competitors a captain who directly participates with the robot in competition. Only the captain may be in the competition area during attempts.

3.1.3 The captain may only move/attack the robot when allowed to do so by the referee.

3.1.4 Other team members, spectators should be at least 150 cm away from the playing field.

3.1.5. No one should touch the field of play or the robot during the attempt.

3.2. Start

3.2.1 The attempt begins in accordance with the competition schedule. The team is informed in advance about the order number of the performance.

3.2.2 The referee asks the captain if everything is ready to start and after a positive answer the timer starts.

3.2.3. The robot is given a maximum of 3 minutes to try.

3.2.4. Once the team is ready to start, they inform the referee. To start, the robot is placed in the starting position as shown by the referee. From now on, calibration is prohibited.

3.3. Playing process

3.3.1 The start area of the robot is in a plate marked green.

3.3.2 The robot must perform 2 missions in overcoming the maze.

3.3.3 If the robot loses parts of the structure while performing the task, all of them must remain on the playing field until the end of the attempt. Neither team members nor referees must remove any parts from the field of play.

3.3.4. I mission - the robot, controlled by the assembled and programmed console, must pass from the Start area to the Finish area, marked in red.

3.3.5 The path to the maze is chosen by the team at its discretion.

3.3.6 The attempt is considered complete if the robot is in the Finish zone.

3.3.7. 2 attempts of 3 minutes each are given for passing the I mission.

3.3.8. Scores are awarded for successful completion of the mission. The shortest time is also counted. That is, the best successful attempt is scored.

3.3.9. In the second mission, the referee puts three artifacts on the field.

3.3.10. The robot's mission is to deliver the maximum number of artifacts to the Finish zone.

3.3.11. The delivered artifact must be completely in the Finish area. Otherwise, the result will not be counted.

3.3.12. The robot is allowed to return from the Finish zone for the remaining artifacts in the field until the end of the attempt time.

3.3.13. The robot may not throw artifacts over the walls of the maze.

3.3.14. The robot must pass the maze from the start to the finish point as soon as possible.

3.3.15. The robot is allowed to make 2 attempts for a maximum of 5 minutes on mission II.

3.3.16. Scores are awarded for each delivered artifact. The shortest time for a successful attempt is also counted.

3.4. Scoring.

3.4.1 Successful passage from the Start to the Finish zone - 100 scores.

3.4.2 Figure 2 shows an approximate maze diagram. If the robot did not reach the Finish zone, scores

are awarded in proportion to the robot's location on the field.

1 row – 10 scores
2 row – 30 scores
3 row – 50 scores
4 row – 70 scores
5 row – 90 scores

Figure 2. Maze diagram

3.4.3 The team receives 70 scores for each successfully delivered Artifact.

3.4.4 If the Artifact is not completely in the finish zone, 50 scores is awarded.

3.4.5 For an Artifact removed from its original location cage, 10 scores is awarded.

3.4.6. When determining the winner, the scores and time for both missions are summed up. The winner is the team that scored the maximum point for the shortest time.