Annex
to the Regulations on the X International Festival of Robotics,
Programming and Innovative Technologies "RoboLand 2025"

COMPETITION REGULATIONS

«FISCHERTECHNIK »

Age of participants: 9-14 years.

Team: 1-2 people.

Robots: autonomous robots.

Equipment used: FISCHERTECHNIK.

Programming language: no restrictions.

Description of the task: performing a series of mini-tasks on a specially prepared field. Robots assembled from FISCHERTECHNIK parts must follow a given trajectory, performing tasks in a certain sequence. The task is formed by the organizers on the day of the competition and includes 9 mini-tasks, the completion of which is assessed by accuracy and time.

1. Requirements for robots

1.1. The controller and motors used to assemble the robots must be from the FISCHERTECHNIK series of educational platforms .

1.2. Only original FISCHERTECHNIK parts may be used to create the remaining parts or units of the robot .

1.3. The maximum width of the robot is 250 mm, length is 250 mm, height is 250 mm. During the entire race, the robot is prohibited from changing its dimensions so that they exceed the permitted ones.

1.4 The robot must be autonomous.

1.5. The robot must be brought assembled on the day of the competition.

1.6. The robot body must not damage the surface of the competition area in any way, otherwise the team may be removed from the competition and disqualified.

2. Requirements for the landfill

2.1. The field is a white banner measuring 1200×2400 mm (Appendix No. 1).

2.2. The white banner has a grid that is invisible to sensors. The cell size is 10x10 cm.

2. 3. The launch pad is a 30x30 cm green square, inside which the robot must be located entirely at the moment of launch.

2.4. The finish area is a red rectangle measuring 120×30 cm, within which the entire robot must be located at the finish line.

2.5. Possible elements on the field:

2.5.1. A skittle is a tin can with a capacity of 33 ml, wrapped in white paper or cardboard. The bottom of the skittle should be weighted. The weight of the weighting agent is approximately 50 g.

2.5.2. Wall - can be made from A4 size cardboard, using Lego pieces as a base. Approximate size of the wall is 29 cm x 21 cm.

2.6. The color of the lines applied to the field for robot recognition is black. The line segments are applied with black insulating tape 25 mm wide.

3. Competition procedure

3.1. The robot must perform movement using algorithms for calculating precise movements and sensors for orientation on the field. A specific task includes 10 mini-tasks that are performed in a given sequence. The task is formed by the organizers on the day of the competition and is given to the participants at the beginning of the competition day. The entire task must be implemented in one program. The mini-tasks described in these regulations may differ in wording in the final task.

Note: It is guaranteed that if the competencies are completed in the correct sequence, the robot will get from the start zone to the finish zone.

3.2. Before the start of the competition, the team is given at least 1 hour to debug and test the robot.

3.3. Before the start of the attempt, all participants hand over their robots to an area inaccessible to them (quarantine). If during the inspection a violation in the robot's design is found, the judge gives 3 minutes to correct the violation.

3.4. If it is impossible to correct the robot, the team is not allowed to attempt.

3.5. During the competition, participants may take robots only from the quarantine zone and only at the command of the judge.

3.6. The maximum time to complete the task is 2 minutes.

3.7. The team starts the competition at the judge's signal. The robot must be completely located in the "Start" starting zone. After the judge's command, one of the operators starts the robot.

3.8. To complete the mini-tasks, participants must have the following competencies:

3.8.1. Starting the robot by pressing a button on the controller unit or touch sensor.

3.8.2. Precise movement of the robot over a given distance.

3.8.3. Precise rotation/turning of the robot at a given angle.

3.8.4 Using sensor readings to control the robot in the field, including encoders, light, color, distance and touch sensors.

3.8.5. Assembly of a structure for linear movement of objects.

3.8.6. Compiling a program using a linear algorithmic structure and a cycle.

3.9. The assignment will include some of the following mini-tasks:

3.9.1. Drive straight forward (backward) at *S* cm and stop.

3.9.2. Determining the distance to an object (mark).

3.9.3. Perform a tank turn to the right (left) by 90° (180°).

3.9.4. Make a right (left) turn by 90° (180°) around one wheel (one wheel is locked, the other rotates forward or backward).

3.9.5. Driving forward (backward) with a stop on the black line.

3.9.6. Driving forward with a stop at a specified distance from an obstacle.

3.9.7. Driving forward (backward) with detection of an object from the side.

3.9.8. Rectilinear movement of the pin into the zone.

3.10. The end of an attempt is recorded in one of the following cases:

3.10.1. The robot stopped in the "FINISH" zone.

3.10.2. After 2 minutes from the start of the attempt.

3.10.3. The participant prematurely interrupted the attempt by saying the word “Stop”.

3.10.4. The participant touched the robot.

3.10.5. If the robot is unable to continue the competition and/or the robot loses motor activity for 20 seconds (determined by the judge).

3.10.6. The robot left the testing ground with its projection.

3.11. The competition is held in two runs. Each team makes one attempt in two runs. After the first attempt, the team quarantines the robot until all participants have completed the test. At least 30 minutes are given to prepare for the second attempt.

4. Counting points and determining winners

4.1. The attempt with the maximum number of points is counted.

4.2. The team with the highest number of points will be declared the winner.

4.3. In case of a tie in points in the best attempt, the winner is determined by the highest points in the less successful attempt.

4.4. If teams score the same number of points in two attempts, the team that spends the least time on completing the task is declared the winner.

4.5. Accrual of points:

Criterion	Points
The robot completed a mini-task	9 p. x 10
Robot touched the finish line - the robot touches the finish area	5 p.
Robot has finished - the robot's projection is completely in the finish zone	5 p.
Maximum:	100 p.

5. Permissible simplifications when conducting selection stages

5.1. No restrictions on the overall dimensions of the robot.

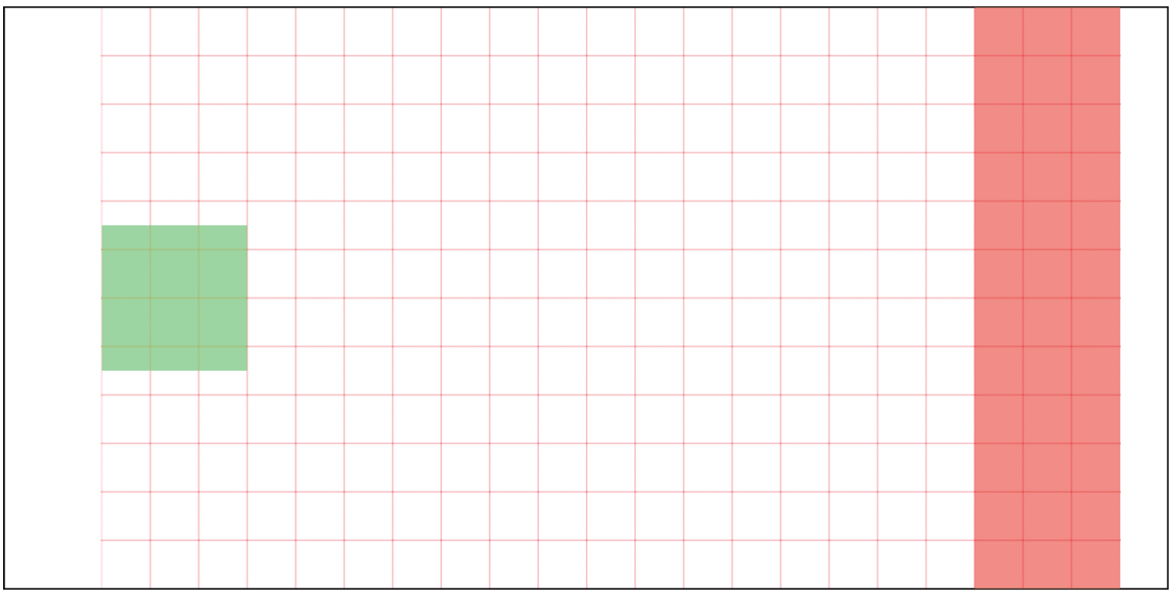


Fig. 1. **Polygon**

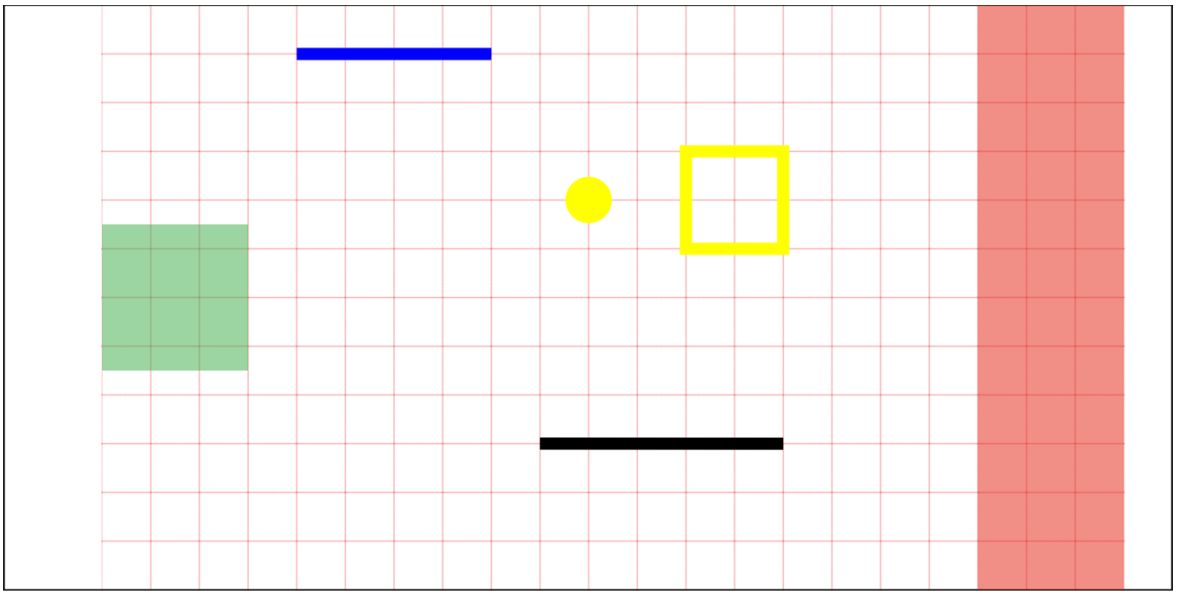


Fig. 2. **An example of a competition site prepared for an attempt**

Blue line - obstacle (wall)

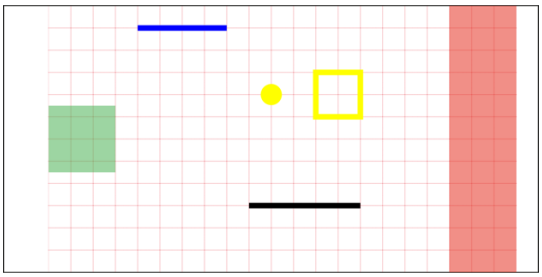
Yellow circle - location of the can installation (not applied to the landfill)

Yellow square - can delivery zone (applied to the polygon with yellow tape)

Black line - a line on the field for recognition by the robot (applied to the polygon with black tape)

Appendix No. 2

Example of a task

1. Drive forward 30 cm from the starting area	 Example of field configuration
2. Tank turn left 90 °	
3. Driving forward with a stop at a distance of 20 cm from an obstacle	
4. Tank turn right 90 °	
5. Driving and moving the pin into the zone	
6. Backward travel 20 cm	
7. Tank turn right 90 °	
8. Driving forward and stopping on the black line	
9. Turn left 90 ° around the right wheel	
10. Drive forward with a stop at the finish area	

Appendix No. 3

Recommendations for judges

1. Time is recorded in the training ground area using a timer.

2. If the robot's projection leaves the testing ground, the judge must stop the attempt.

3. If the attempt was interrupted by agreement with the judge or by the judge himself, the points scored by the team are recorded in the protocol and the maximum time of 2 minutes is recorded.

Appendix No. 4

Recommendations for organizers

1. Each team is provided with a work space (table, 2 chairs).

2. The field is placed in a place accessible to spectators.

3. Team leaders are not allowed to participate in the competition.

Note: When developing the regulations, materials from mosrobotics.ru were used