РОБОФИНИСТ

«LABYRINTH: THERE AND BACK»
CONTEST RULES

*Version **2.0** dated July 20, 2017*

Contents

1 General Provisions

1.1. Task Description

The robot need to get from starting area to finish area and back in the allotted time.

2 Labyrinth Field Specifications

Labyrinth field consists of cells of 30x30 cm. The maximal size of the field is 5x11 cells.

Wall with height of 10 cm and a thickness of 16 mm can be installed between the cells. Walls are also installed around the perimeter of the labyrinth. There can be gaps and overhangs up to 5 mm between the walls.

Labyrinth configuration should meet the following criteria:

there is a way between each two cells and this way is unique. As a criterion of the unicity of the way can be an absence of cycles in the labyrinth;

number of cells with no wall around is no more than three;

there is at least one wall inside each square of four cells (see Fig. 1).

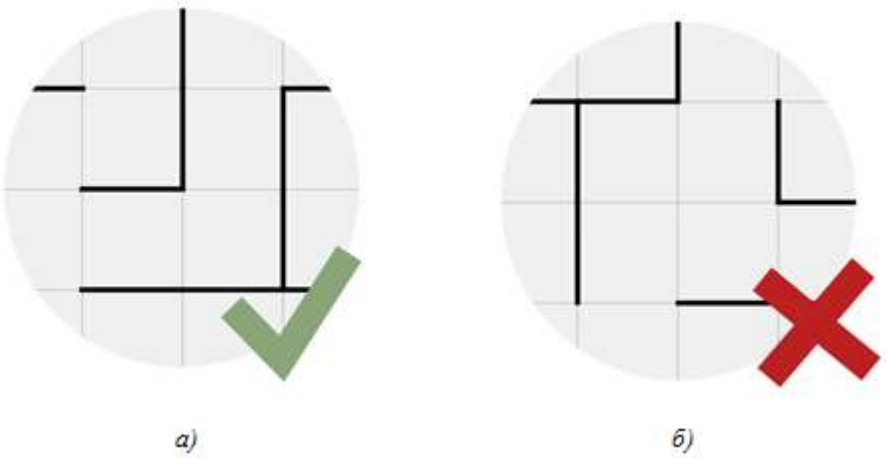

Fig. 1. a) admissible configuration of the walls; b) invalid configuration of the walls – there is no wall inside the square of four cells.

Starting area and finish area are limited with a black line. The cell with the starting area (“starting area”) is red colored; the cell with the finish area (“finish area”) is green colored (see Fig. 2).

The configuration of the walls changes just before the attempt.

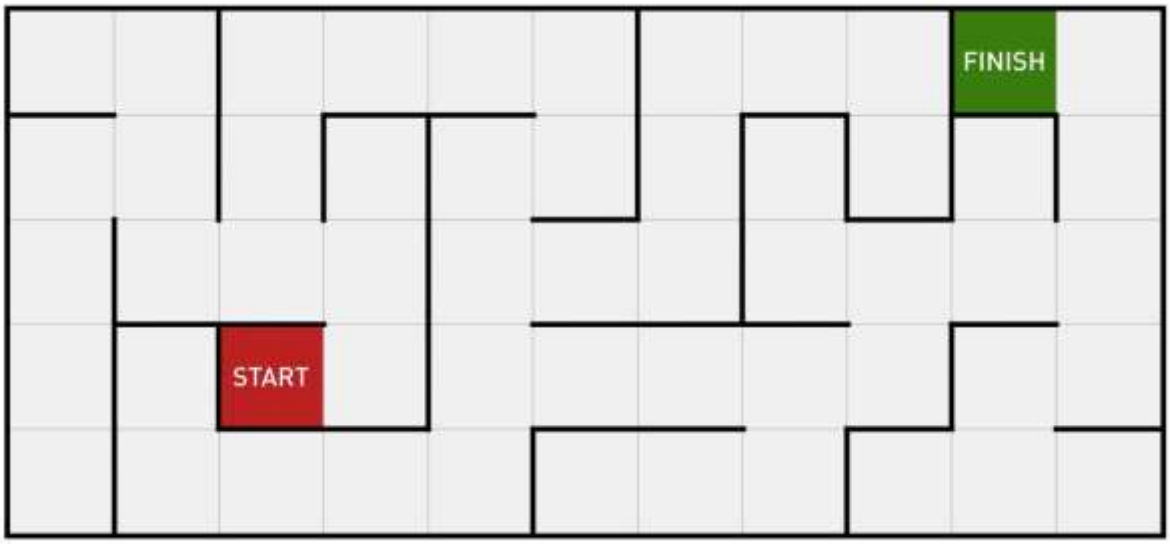

Fig. 2. Field scheme example

3. Robot Specifications

The following requirements apply to robots:
width is no more than 25 cm,
length is no more than 25 cm;
height is not limited.

During the Contest robot dimensions can be changed but not exceed the specified dimensions.

During the movement the robot may not exceed the specified dimensions.

4. Procedure of the Competition

Each participant attempt lasts 8 minutes. During this time the robot of the participant may start an unlimited number of races.

During attempt the participant cannot change the robot structure and program, but the robot can be launched running by different programs.

During attempt the participant can stop a race, the robot can be relaunched.

If the robot does not leave the cell within 30 seconds, the race must be stopped and the robot must be relaunched if there is time left for attempt.

4.1. Ineligibility Conditions

In the following cases the robot will be disqualified:
the robot is non-autonomous (the human is in control of the robot);
during the attempt the participant has touched the labyrinth or the robot.

5. Procedure to Determine the Winner

Scoring rules:

It is determined the number of cells at the field that make up the shortest way from start to finish (hereinafter referred to as the length of the shortest way).

Robot motion at the field consists of two consecutive stages - route from start to finish (hereinafter referred to as the route “there") and route from finish to start (hereinafter referred to as the route “back”). Route "back" begins after the robot was in the finish cell.

For completing of each route a robot gets points according to Table 1, which in sum equal the result of the race.

For completing of a route having cells which are not in the shortest way, a robot gets 5 second more for race time.

N — the number of sections in the shortest way

Y — total number of labyrinth sections

Table 1. Scoring points

No.	**Evaluation criterion**	**Number of points/time**	
		For each section	**Maximum**
1	**2**	**3**	**4**
The route “there"			
1.	The robot remains in the starting area	0 points	0 points
2.	The robot fully enters the section which is in the shortest way (except for the starting area)	1 point	N points
3.	The robot fully enters the section which is not in the shortest way	5 second	5 second*(Y-(N+1))
The route “back”			
1.	The robot remains in the finish area	0 points	0 points
2.	The robot fully enters the section which is in the shortest way (except for the finish area)	1 point	N points
3.	The robot fully enters the section which is not in the shortest way	5 second	5 second*(Y-(N+1))
	Total (points)		**2xN points**
	Total (time)		**10*(Y-(N+1))**

Each team is given no less than one attempt. The exact number of attempts will be determined by jury on the day of the competition. The best time of attempts is counted.

The race with maximum result is considered as the best race of the attempt. If there are several races with similar results, the race robot took the less time to perform is considered as a best.

Result of the best race in the attempt is announced as result of the robot in the attempt.

The best one of the results of attempts is announced as the final result of the robot.

The robot with the best (maximum) final result is announced as the winner of the contest.

If two robots have an equal number of points, the best (minimum) time of the best attempt is taken into account.

6. Revision History

№	Doc. No.	Date	Note	Previous Version	Update Version
1	**2**	**3**	**4**	**5**	**6**
1.	1.1		Paragraph changed		3.1
2.	1.2		Section changed		3
3.	1.3		Paragraph removed	3.4.7	-
4.			Paragraph added	-	3.6
5.	1.4		Section changed	3.4.3	
6.	1.5		Section changed	2.2, 3	
7.	1.6		Section changed	2, 3	
8.	2.0		Entire text changed	Based on version 1.6	
9.					
10.					