



REPUBLIC OF TURKIYE
MINISTRY OF NATIONAL EDUCATION
The General Directorate
of Technical and Vocational Education

16th INTERNATIONAL MoNE ROBOT CONTEST

ADVANCED LINE FOLLOWER ROBOT CATEGORY RULES

INTERNATIONAL
MoNE
ROBOT
CONTEST



COMPETITION RULES

Objective

Line follower (Advanced) robots are designed to be able to follow white line on black ground or vice versa autonomously. They are commonly used to carry the goods from one place to another in industry. It is just enough to draw only lines on ground of plant to do this. What is important in line-following robots is the correct program, hardware control and speed to follow the line.

Autonomous line follower robots in this category follow the white lines on the black track and try to complete the track in the shortest time without any errors.

The aim is to complete the track determined in the competition in the shortest time and with the least penalty points to qualify for the final competitions.

ROBOT DIMENSIONS

Robot has maximum 240mm length, 180mm width and 100mm height.

Track Information

1. Lines are indicated as white color on black ground and vice versa.
2. Tracks which have 400mm width, 5mm thickness are made by black opaque PVC foam. Joints between parts that made up the track are covered with black opaque foil.
3. Lines on black ground are made by using white opaque foil through the middle of the track with 20 ± 2 mm width.
4. For qualifying race, start line is placed 500mm far from the front edge of track.
5. There is a 20cm marker line placed in the center of the track line before each turn, provided that the robot is in the direction of movement. These marker lines are 30cm behind the start of the turn arc.
6. If the straight path before the turns is shorter than 30cm, no turn marker line is placed.
7. Since the first turn in the direction of robot movement is also the last turn in the direction of arrival, there is a marker line both at the entrance and exit of this turn.
8. In addition, one marker line was placed 30 cm behind the return path at the intersection of the departure and return paths.
9. Sensors of chronometer 10mm above the ground are placed on the edges of start line
10. In the Qualifying and Final competitions, there is a 400mm wide and 200mm high white automatic gate in line with the start/finish lines of the two tracks.
11. There will be two qualifying tracks and they will be prepared as shown in the figure. These tracks will be called track A and track B.

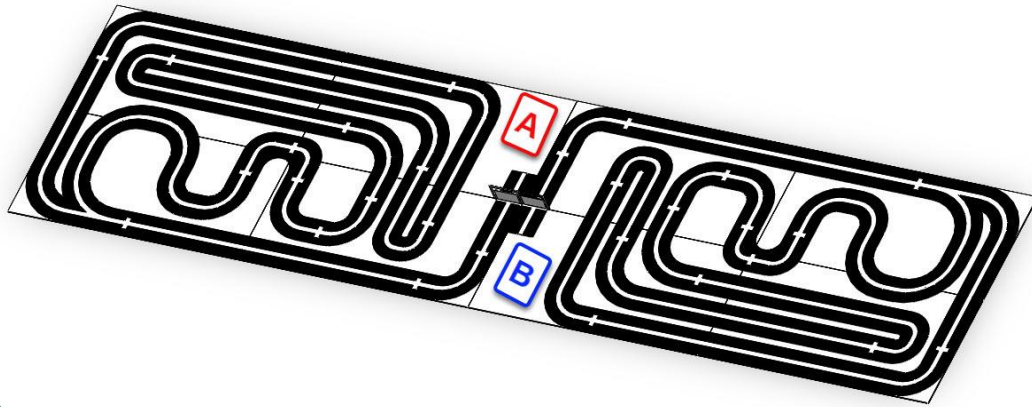
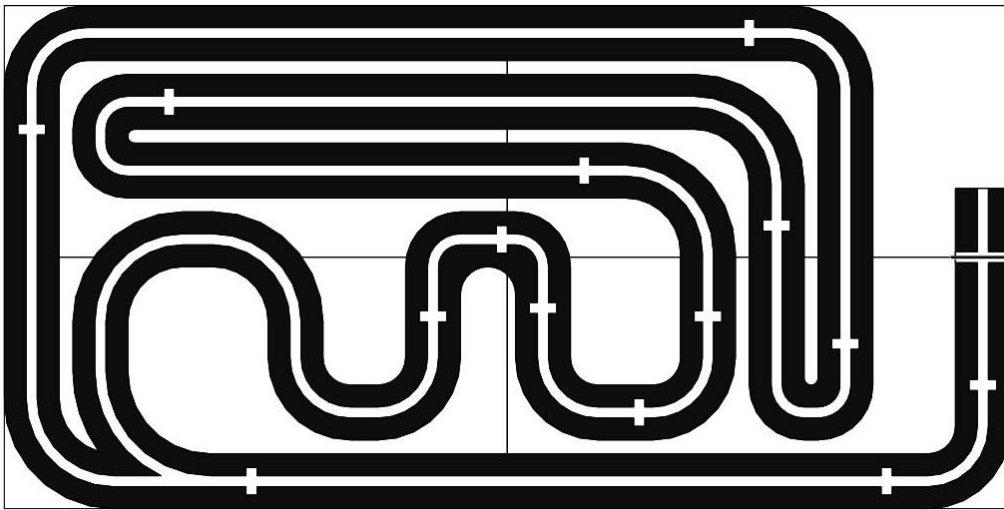


Figure-1: Track view



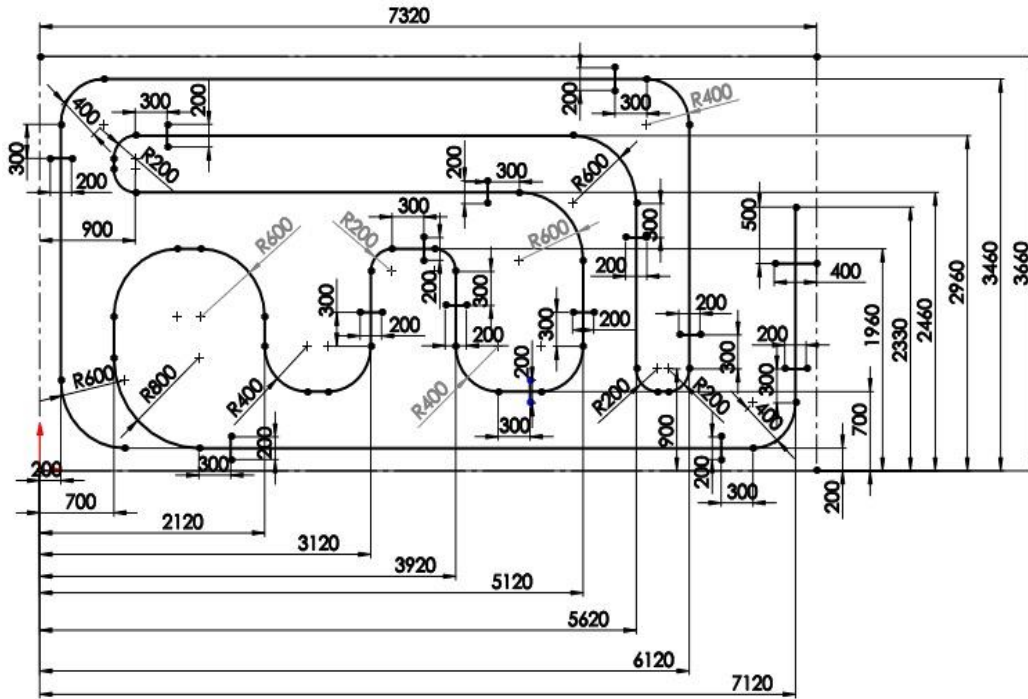


Figure-2: Track dimensions

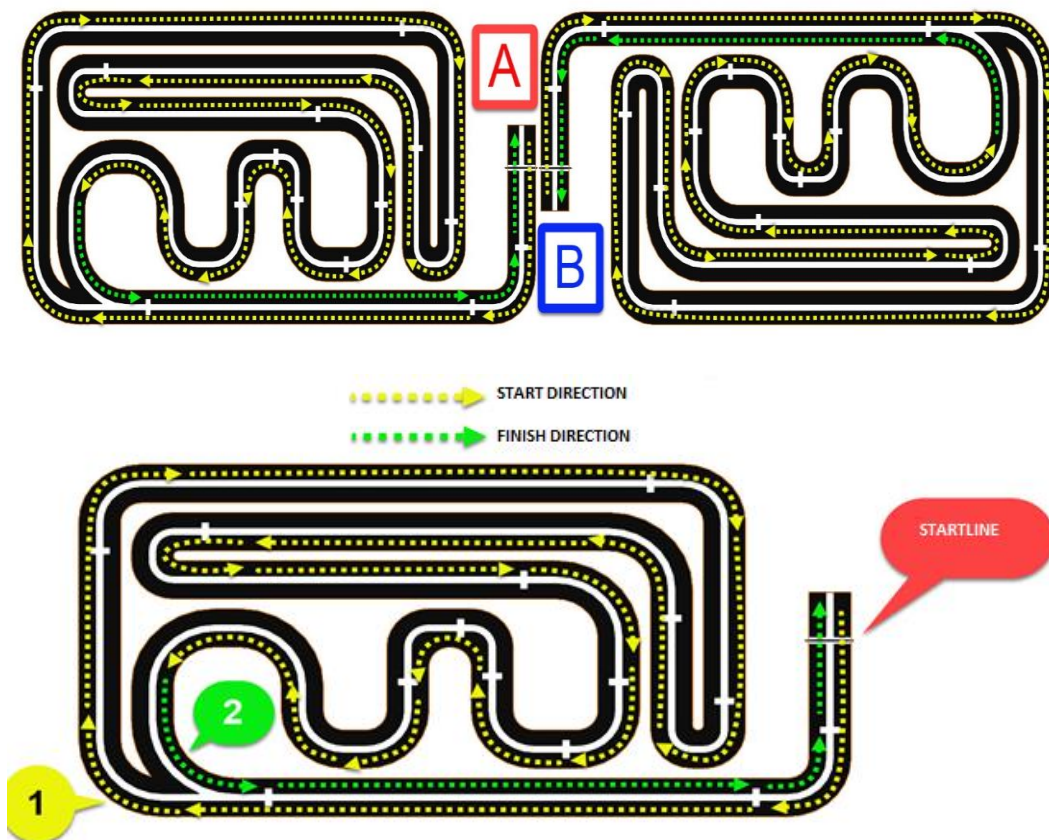


Figure 3 : Robot track directions

12. Robots must follow the direction of movement 1 indicated in yellow.



Final and Qualifying Race

1. Each robot will run one by one. Which track the robots will compete on is determined by computer draw. As a result of the draw, it is determined which track the robot will compete on (track A or track B).
2. The competition format and the threshold for qualification to the next level may be changed depending on the number of competitors. In case of low number of competitors, competitions with points will continue. This will be announced on <https://robot.meb.gov.tr/>.
3. In the Qualifying and Final competitions, there is a 400mm wide and 200mm high white automatic door at the start/finish lines of both tracks.
4. The competition starts after both robots take their places on the track and the referee opens the automatic doors at the same time.
5. The robot that hits the door before the start of the competition is penalized 10 seconds. It is required to reposition the robot.
6. Robots take a lap on the track in the specified movement direction. Robots must move on the track in the specified movement direction (See Figure_3).
7. The first robot to finish the track, or if robots have received penalty points, the robot with the least total time qualifies for the next round.
8. Time penalty (10sec) is given to the robot which couldn't start and the robot takes the starting position again. The robot has 3 rights for starting. (for each unsuccessful start will be punished separately with 10sec time penalty)
9. In the event that the robot goes off the road (the body of the robot descends from the black road onto a completely white background), the robot is placed after the start point and the competition continues. This situation is applied to a competitor once. In case of going off the road for the second time, the robot is considered to have not completed the track and is disqualified.



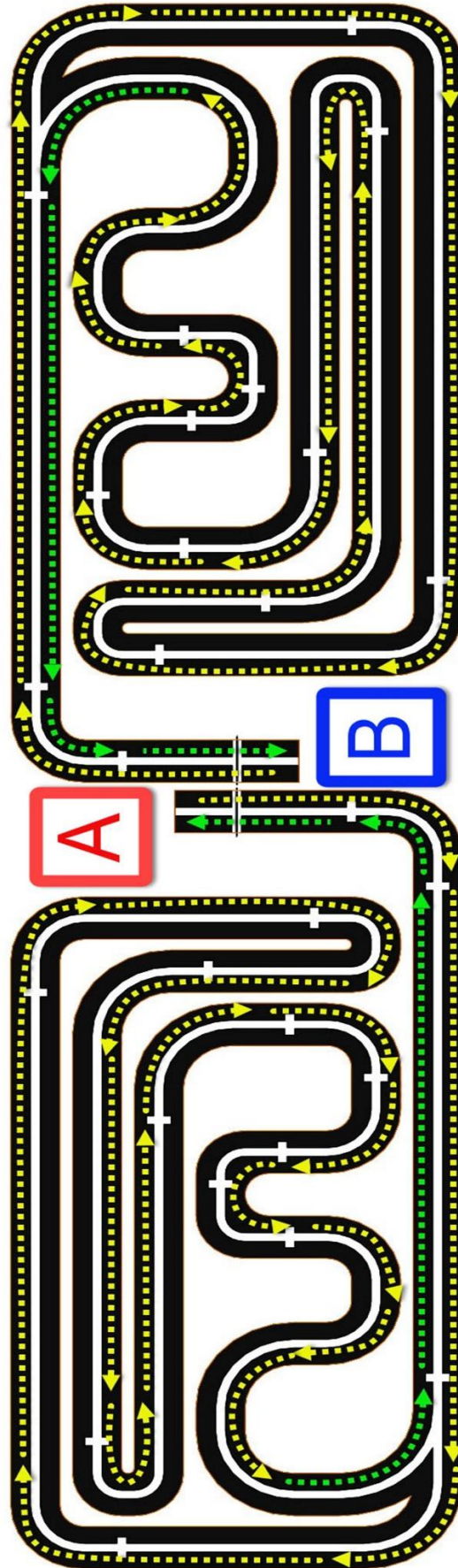


10. If the competitor robot cannot enter the outbound direction at the path selection point and enters the inbound direction, it receives a 10sec penalty point and continues the competition by being placed behind the marking line before the intersection point.
11. During the competitions, the robot that leaves its own track area and enters the opponent's track area is disqualified.
12. Total time = [(Stopwatch time + sum of penalty times)].
13. The total times of the robots that qualify for the next round are also noted. In the next round, groupings will be made so that the robot with the best time matches the robot with the worst time.

Other Rules

1. Any time for break or maintenance will not given.
2. It is not allowed to put any sign or mark permanently on the track or to damage it. Robots which damage the track will be disqualified.
3. Robots can use an energy source such as battery or battery pack. Flammable or liquid type energy sources are forbidden.
4. No any modification is allowed during the race except changing wheels and batteries of robots. If physical changes such as changing body is determined, robot will be disqualified.
5. If QR code is dismounted, changed or damaged, robot will be disqualified.
6. If robot doesn't match with its photo, it will be disqualified.
7. If it is necessary to change electronic component, same component should be used on same place. QR code must not be damaged during this process. Otherwise, robot will be disqualified.
8. QR code must be stucked on robot body but not on detachable parts. Otherwise robot will be disqualified.
9. Track dimensions can be changed slightly without changing pattern
10. Any objections due to led panels, lights, camera flashes etc will be refused.

Competition Executive Committee has rights to make all kinds of modifications about the rules of contest in case of necessities.





NO	ROBOT	START FAILURE 10 sec			PENALTY FOR CRASHING AUTOMATED GATE 10 sec.	PENALTY FOR ENTERING TO OPPOSITE DIRECTION 10 sec	STOPWATCH TIME	TOTAL TIME
		NUMBER OF START FAILURE	TOTAL					
1								
2								
3								
4								
5								
6								
7								
8								
9								
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12								
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