



robotex¹⁸
INDIA

Line Following Challenge
Rules



Contents

1	Introduction.....	3
2	Robot classes	3
3	The Field.....	3
4	The Robot.....	3
4.1	Additional requirements for LEGO robots	4
5	The Competition.....	4
6	Organizing.....	5
7	Changes and cancellations in the rules.....	5
8	Appendix 1. The dimensions for the track and robot.....	6
9	Revision history	7

1 Introduction

Line following is one of the most popular robotic competitions in the worlds and it is carried out at Robotex for the sixth time. The task for line following robots is to drive through the track that is marked with a black line, as fast as possible. Two robots are competing alongside each other on parallel mirrored tracks. Line following is held in two different categories: LEGO and the others.

2 Robot classes

In the Robotex 2017 line following competition there are represented only autonomous robots in two different classes: LEGO robots and other.

3 The Field

1. The field is a white synthetic sheet with an area of 3 to 10 cm².
2. The fields stand alongside each other and are mirrored.
3. The 15 mm wide line, or track, has been printed on the field with black ink or marked with a black tape.
4. The minimum turning radius of the line is 0.
5. The line is surrounded by 25 cm of free space on both sides, except on cross-sections.
6. The lines on the cross-section are perpendicular at least to the extent of 20 cm.
7. The start and finish lines are marked on the field separately.

4 The Robot

1. The robot must be autonomous.
2. The maximum dimensions of the robot are 25 x 25 x 25 cm and mass 1 kg. NB! LEGO robot measure box will be 25 x 25 x 25 cm with +2 mm tolerance.
3. The robot must always cover the line once it follows it, otherwise the race is considered to be failed.
4. The robot must not damage the field or endanger the spectators in any way.
5. It is forbidden to use higher voltage than 24 V in the robot.
6. The robot must have a start and stop button or a remote control.
7. The body of the robot must entirely block the light beam of the time measuring system with a diameter of 3 mm at the height of 3 cm.

4.1 Additional requirements for LEGO robots

- The robot must be exclusively constructed of the licensed parts of LEGO® original or HiTechnic®. There is an exception for wires used in the robot, wires must be the licenced parts of LEGO® original, HiTechnic® or Mindsensors.
- The robot must use only batteries or cells that are recommended by LEGO®.
- LEGO EV3/NXT robots and LEGO RCX robots compete in different categories for different prizes which are given out proportionally.

5 The Competition

1. The robots compete in driving through the track in one direction, being timed at the same time, on two mirrored tracks, situated alongside each other.
2. An optical time measuring system measures the start and finish times at the start- and finish lines.
3. The competition queue will be either drawn by lots or determined according to the order of registration.
4. In one round, there are two competing robots. The exception is the qualifications, where it is not obligatory.
5. There are maximum three trials in one round.
6. The robot's track is drawn by lot.
7. It is not necessary to complete both tracks in the qualifications.
8. A robot, that achieves more victories in the trials, qualifies for the next round.
9. A robot, that achieves the best time, wins the trial.
10. Robots must start the trial when the referee gives the signal.
11. The robot must start moving in 3 seconds after the referees start command. If the robot does not start moving within 3 seconds after the referees start command, it will lose the trial. If both competing robots do not start moving within 3 seconds after the referees start command and it is a decisive attempt, there will be another round. Otherwise none of the robots will get a point for this trial.
12. Maximum lap time is 2 minutes. If the robot exceeds this time, it will lose the trial.
13. If both robots do not reach the finish line in two minutes and it is a decisive attempt, there will be another round. If neither of the robots reach the finish line in this round as well, then the winner of this trial will be the robot that reaches closer to the finish line.
14. It is forbidden for the robot to drive off the track; if this happens, the robot will lose the trial.

15. If both robots drive off the track during a trial and it is a decisive attempt, then there will be another round. If both robots will drive off the track also in this round, then the winner of the trial is the robot who reached furthest.
16. One team can register up to 5 members.
17. The competitions take place in two categories: LEGO and the other robots (LEGO robots have a shorter track).

6 Organizing

1. The competition and testing fields are made of same materials.
2. The robot must be registered before the competition. The registration process includes technical inspection of the robot, marking the robot with a number sticker and the order number will be drawn.
3. Technical inspection must be completed by the time specified by the organisers.
4. All questions and problems that may arise during the competition, are solved by the referee.
5. The final decision regarding any appeals is made by the referee and/or the organizers. All complaints must be reported to the referee during the match or right after the ending of the match. Complaints filed later will not be accepted. The final decision regarding any disputes or inconsistencies, is always made by the referee.

7 Changes and cancellations in the rules

Changes and cancellations made to the rules are adopted by the main organiser of the competition, according to the regulations of the regulatory committee of the competition.

8 Appendix 1. The dimensions for the track and robot

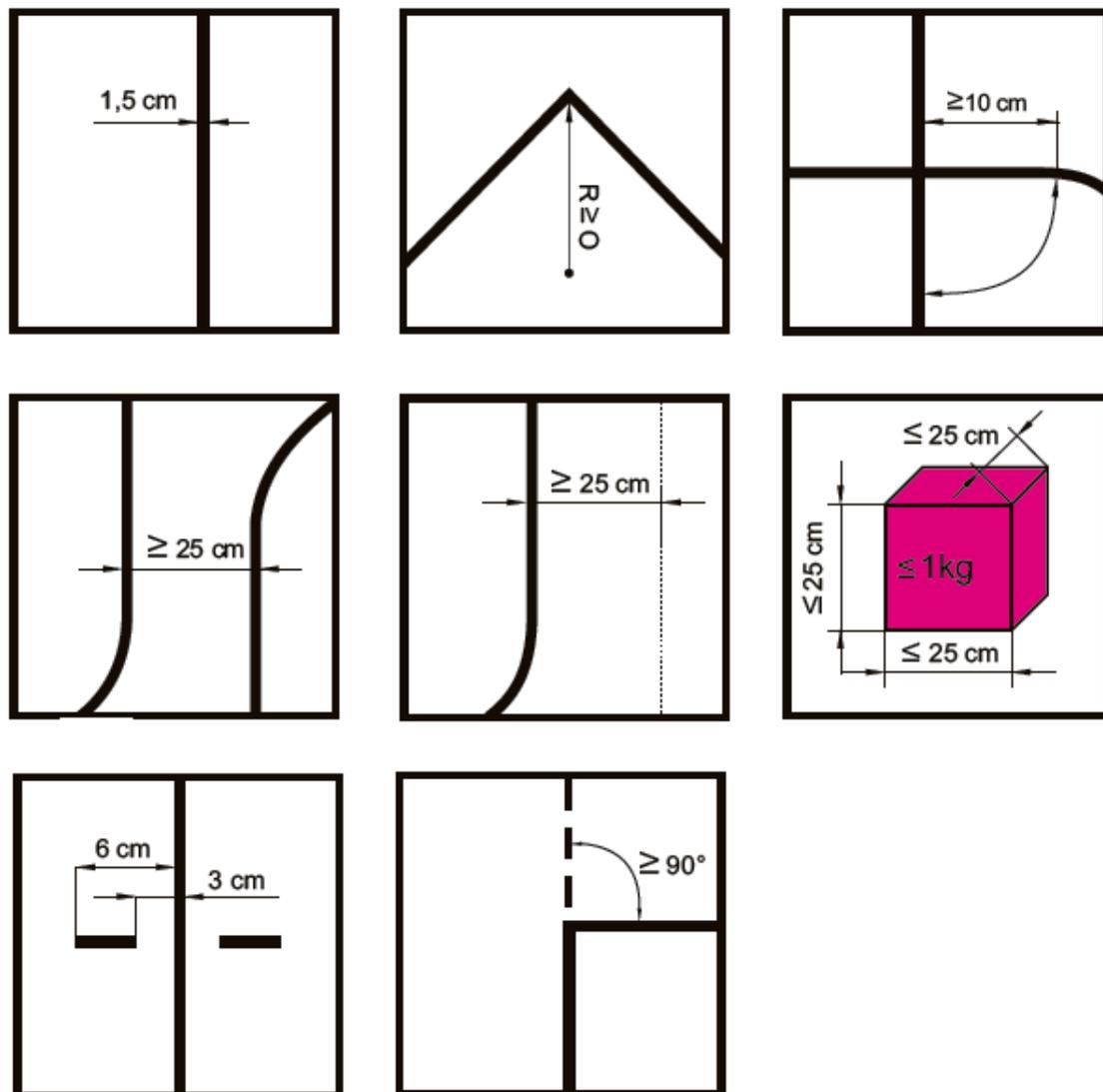


Figure 1: The dimensions of the track and robot.

9 Revision history

1. Clause 4 in paragraph 4 was amended on 21 April 2016. Robots do not have to compete in the same round in the qualifications.
2. Clause 7 in paragraph 4 was amended on 21 April 2016. Robots do not have to complete both tracks in the qualifications.
3. Clause 11 in paragraph 5 was amended on 28 May 2017. Condition was added about the start of robots.
4. Clause 13 in paragraph 5 was amended on 28 May 2017. Specification regarding the situation in which neither robot finishes the track in prescribed time was added.
5. Clause 15 in paragraph 5 was amended on 28 May 2017. Specification regarding the situation in which both robots drive off the track was added.
6. Clause 5 in paragraph 6 was amended on 28 May 2017. Specification was added about complaints.
7. Clause 11 in paragraph 5 was amended on 03 July 2017. Specification about the consequences, if the 3 second rule is not met.
8. Clause 1 in paragraph 4 was amended on 13 October 2017. Added a clarification about wires that are allowed in Lego line following robots.

