

## **MIND THE LINE**

### **ELEGIBILITY**

1. The competition is open for registration to full time Engineering/ Science/ Polytechnic College/ School students who are studying in universities/ colleges/ Schools.
2. Each team can have four members at max.
3. Each student can join only one team.
4. One member of the team should be designated as the team leader, who will be responsible for all communications with InfoX team.
5. InfoX judges' decision is final should there be any dispute.

### **TERMS AND CONDITIONS**

1. Each team member will register with only one email ID.
2. A team will NOT BE PERMITTED to change/replace any team member(s). A team once registered will remain unchanged till the end of competition.
3. Failure to comply with any of the rules, terms and conditions of the competition may result in disqualification of the participating team.
4. All participants (implicitly) consent to allow their names and photographs to be used for publicity purposes by InfoX during and after the competition.
5. All material submitted must be the team's original work.
6. Any kind of plagiarism is strictly prohibited and will lead to disqualification of a team.
7. In case of any disputes/discrepancies, InfoX's decision is final and binding. InfoX reserves the rights to change any or all of the rules as we deem fit. Any change in rules will be highlighted on the website and notified to the participating teams. Changes will be made only before commencement of the competition.
8. InfoX's decision is final and no appeals will be entertained.

### **RULES**

1. The Event Involves Autonomous Robot-Car following a black line on a given track with nodes, Turns, Elevated Bridges along with obstacles and hurdles. The complete traversal needs to be completed within a given time frame of 10 minutes at

maximum. End of maximum time limit will mark the end of run, regardless of car's position and status.

2. The exact design of arena will be revealed 20 mins prior to the commencement of the competition. Participants will be given these 20 mins to practice and calibrate the threshold readings for the sensors.

3. Exact design will be revealed only few minutes before the commencement but participants can expect following features in the arena :

- At any particular node a bifurcation can be present, Line following robot has to process and decide which path should be taken.
- One of the path will be obstructed by a wall in front .So robot has to change its path and follow other path.
- At the end of the race there will be obstruction from front and right( Robo car has to detect those walls to check the END point).

The complete racing track would be only revealed on the day of event. As for arena dimension related specifications refer to Section “**ARENA SPECIFICATIONS**” (Involves thickness of blackline, Width of track, Obstacle etc.).

1. The area marked as ‘**START**’ will be the starting point and ‘**END**’ marking will signify End point in the arena(At the end point a front wall and right wall will be there for robot to detect).

2. If robot is found to be displacing any obstacle/hurdle, or damaging the arena, it will be considered as the end of the run.

3. Line following Robot cannot leave the arena during the run. No more than one wheel is allowed outside the arena at a given time.

4. In case Line following Robot gets stuck while crossing an obstacle, it can be repositioned within a radius of 10cm. The Maximum no of repositioning allowed is 2.

5. All repositions require the approval of the reviewer.

6. Participants are not allowed to keep anything inside the arena other than the robot.

7. The time measured by the reviewer will be final and will be used for scoring the teams. Time measured by any participant by any other means is not acceptable for scoring.

8. The team should Switch ON the robot when asked by the reviewer. This is the start of a run. The timer will start at the same time.
9. The robot is not allowed to make any marks while traversing the arena. Any robot found damaging the arena will be immediately stopped. The final decision is at the discretion of the InfoX team.
10. The Final Score will be decided by taking time taken, penalties, bonus into account as explained in Section “**JUDGING CRITERIA**”.

### **ARENA SPECIFICATIONS**

- **Min Track Width : 24 cm**
- **Min Black Line Width : 1.5 cm**
- **Max Elevation Height : 15 cm**
- **Max Elevation Angle : 25 deg**
- **Min Turn Angle : 75 deg**
- **Max Obstacle Height : 1.8 cm**

### **HARDWARE SPECIFICATIONS**

- A maximum of two sharp sensors are allowed.
- A maximum of 4 White line sensors are allowed.

#### **Dimensions and Fabrications**

- The machine should fit in a box of dimension 30 cm x 30 cm x 30 cm (l x b x h) at start of during the match. The external device used to control the machine or any external tank is not included in the size constraint.
- The machine should not exceed 40 kg.
- Any part of bot which is outside arena (whether it is battery or external tanks) except remote control and wires are included in weight (1.5 Times of actual)  
**for example** An external Battery source.

#### **Methods of mobility include:**

- Rolling (wheels, tracks or the whole robot).
- Walking (linear actuated legs with no rolling or cam operated motion).

#### **Battery and Power**

- The machine can be powered electrically only. Batteries must be sealed, immozed electrolyte types (such as Li-ion, NiCd, NiMH or dry cells).
- Working voltages must not exceed 24V DC (mean voltage) at any point of time.
- All power connections must be of an adequate grade and adequately insulated. Cables must be routed to minimize the chances of being cut.

- All efforts must be made to protect battery terminals from a direct short and causing a battery fire, failure to do so will cause direct disqualification.
- Battery Eliminators are allowed and power source would be available at the venue for the eliminators.

## **JUDGING CRITERIA**

1. The competition time for a team starts from the moment the robot is switched ON. The timer will stop as soon as the robot finishes the task.

2. The team's total score is calculated by the following formula:

$$\text{Total Score} = (600 - T) + OB - (RP \times 30)$$

Where:

**Total time (T):** T is the total time in seconds taken to complete the task.

**Overall Bonus Points (OB):** 100 Bonus points will be awarded if run is completed successfully. Successful completion involves the following:

1. Dealt every obstacle/hurdle effectively, without violating any rules.
2. No more than one wheel touched the surface outside the arena at any given time.
3. Didn't displaced any hurdle and obstacle during the run and successfully tackled all the hurdles.

**Reposition Penalty (RP):** 30 points will be deducted for every reposition.