LINE SURFER v.1.0

A Premium Robotics Event

The object of the competition is to design an autonomous robot that will follow a white line on a black surface. All the paths for all the rounds will be predefined. Participants should be able to traverse the paths as per the given rules and guidelines.

The event is divided into three major phases:

1. **Design Phase** **[50 points]**
2. **Performance Phase** **[100 points]**
3. **Final Knockout Round** **[50 points]**

The Top 5 teams that score the maximum points in the Design and the Performance Phases will move into the final Phase which is a knockout based on Time Trial.

GENERAL RULES & GUIDELINES

1. The robot should be completely autonomous. There should be no external manual control, wired or wireless.
2. The Teams must not alter any element of the robot throughout the duration of the competition. However, negligible repairs and sensor calibration adjustments are permitted.
3. The robot should fit in a cubical box of dimensions 30x30x30 cubic centimeter.
4. All teams will be given time to calibrate the sensors before each round of the competition.

THE DESIGN PHASE

1. The robots will be analyzed for design and construction.
2. Points will be awarded based on a presentation, given by each team, highlighting the details of the design, construction and algorithm of the robot.
3. Extra points will be given for out-of-the-box innovations* and control mechanisms.
4. The Highest scorers of this round will be given a special prize independent of the final results.
5. The maximum points that can be scored in this phase is 50. The points for this round will be denoted for each team by **S1**.

THE PERFORMANCE PHASE

1. The teams have to prepare their robots to traverse the line on the provided arena.
2. This phase is divided into two rounds.

ROUND-1

1. The Robot has to traverse the path defined on the Arena, in the shortest time possible.
2. The path will contain various intersections, loops, sharp turns and bridges.
3. The participants have to optimize the performance of the robot to complete the whole path in the shortest time possible.
4. The complete arena will be disclosed well in advance to the competition. (Please contact the Organizers for the same.)
5. Every team will be given a defined period of time (t_max) to complete the task. Failing to do which, will lead to subtraction of a fraction of the time exceeded given by the formula:

$$Round\ 1\ Score, \qquad S2 = \begin{cases} 50 & if\ t \le t\_max \\ 50 - 0.5 \times (t - t_{max}) & if\ t \ge t\_max \end{cases}$$

6. The value of the constant t_max will be defined on the day of the completion.

NOTE: No team is allowed to change the program/code on their robot's computer after this point, under any circumstances. Failure to comply will lead to disqualification.

ROUND 2

1. The Robot has to traverse the path defined on the Arena, in the shortest time possible. The path will contain no intersections, loops or bridges. It may contain sharp turns.
2. The participants have to optimize the robot for speed.
3. The arena **will not be disclosed** prior to the competition.

4. Every team will be given a defined period of time (t_max) to complete the task. Failing to do which, will lead to subtraction of a fraction of the time exceeded given by the formula:

$$Round\ 2\ Score, \qquad S3 = \begin{cases} 50 & if\ t \leq t\_max \\ 50 - 0.5 \times (t - t_{max}) & if\ t \geq t\_max \end{cases}$$

5. The value of the constant t_max will be defined on the day of the completion.

At this point, all the three scores (S1, S2 and S3) will be summed, and the top 5 finalists for the knockout round will be chosen.

THE FINAL KNOCKOUT

1. In this final phase, the robot will have to traverse a simple line, similar to that of round 2 of the previous phase, except, there will be multiple obstructions on the line.
2. Each team will be given a manually controlled robot by the organizers. The team must disengage the obstructions for their line follower robot, using the manually controlled robot.
3. There will be 5 such obstructions.
4. The maximum points that can be scored in this round is 50.
5. For every obstruction crossed by the line follower without being disengaged, 10 points will be deducted from this maximum 50.
6. All the rules, regulations and instructions for this round, will be given on the spot.

DISCLAIMER

1. The decision of the judges/organizers will be final and binding.
2. Invalid arguments by any team member will lead to disqualification of the team.
3. Alteration or modification to the rules may be made by the organizers as long as they are announced prior to the event.

PRIZES:

PRIZES AND APPRECIATION

There will be 3 Prizes for the Main Event:

- **1st (Cash + Certificates)**
- **2nd (Cash + Certificates)**
- **3rd (Cash + Certificates)**

An additional prize will be given to the highest scorers of the Design Phase, the results for which will be disclosed with the results of the main event.

REGISTRATION DETAILS

The registration details are given below:

1. **Online Registration : www.linesurfer.in**
2. **Registration Fees : Rs. 400/- per team**
3. **Maximum number of students in a team is 4**
4. **Please contact the number below to pay money and register.**

CONTACT DETAILS

For any information regarding this event, please use the following links:

1. **Contact Number : +91 962 977 3352**
2. **Email ID : events@robovitics.in**
3. **Facebook Page : www.facebook.com/robovitics**