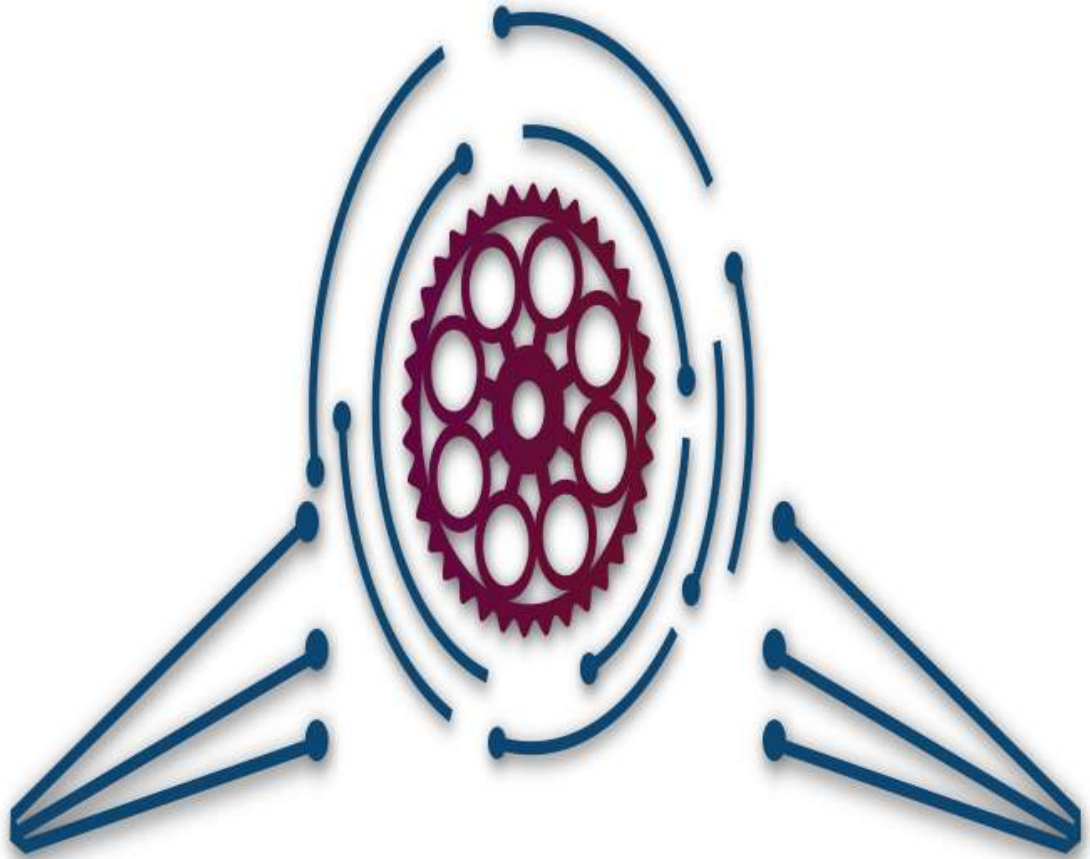


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## ***Line Follower Robot (LFR)***

### **ELIGIBILITY:**

- Student must be of undergraduate level, and each team must have a team name and a team leader.
- A team can have maximum 3 members and minimum 2 members. If any team has four members they have to pay 500/- taka extra.

# Overview

An Autonomous line follower robot that can follow black lines on the white surface under various conditions which includes curved lines, round loops, intersections, right angles acute angle, line gaps, zigzag , bridge, object (2<sup>nd</sup> round).

- The contest will have two rounds –

1.Primary Round

2.Final Round.

A limited number of teams will be selected for the Final round based on total points of the Primary round. Number of teams selected for the Final round will be decided on the competition day based on the number of participating teams.

- In Primary round there will be basic line following challenges where selection will be time wise.
- In Final round, the qualified robots will have to cross bridge , cave .
- Number of checkpoints will be 4 in the Primary round and 5 checkpoints in the Final round.
- Team must place the robot in their respective position and calibrate for run within 2 minutes after calling them to come to the arena. Otherwise team will be disqualified.
- 5 minutes will be provided to each team in the Primary round and 7 minutes in the Final round complete the tasks.
- Based on its points winning team is declared.
- Each team has maximum 5 restarts for each round.
- Only 1 member from the team is allowed in the arena during the main run.
- Touching a bot while running will be counted as restart.

# ARENA SPECIFICATIONS:

- The arena is a white rectangular surface with the dimension which will be announced soon .
- The autonomous robot will have to follow the black lines (on the white surface) which is 3 cm wide.
- There will be a Start zone and a Finish zone on the beginning and the end of the line respectively . Both the Start and the Finish zone will be marked with black square shaped boxes with the dimension of 30cm x 30cm.
- The distance between two adjacent black lines will be at least 20 cm from center to center.
- The acute angles are not less than 30 degree.
- The curved lines have a radius of curvature of at least 15 cm and there is a 10 cm line gap.
- The ascending angle of the bridge will be not more than 30degree and the descending angle will be not more than 40 degree.

# LINE FOLLOWING ROBOT SPECIFICATIONS:

The autonomous robot must satisfy the following design rules-

- **Height:** Minimum 15 cm - Maximum 25 cm
- **Length:** Minimum 15 cm - Maximum 25 cm
- **Width:** Minimum 15 cm - Maximum 25 cm
- **Weight:** Maximum 2 kg
- **Power:** Maximum 24 Volt between any two terminals of the circuit. Each team has to bring its own power supply for robot. No additional equipment/parts will be supplied in the competition.
- Readymade circuit board is allowed but readymade LFR is not allowed.
- No construction set such as LEGO or MECCANO is allowed.
- Maximum Number of switch allowed is two including the power switch and the reset switch.
- No wired/wireless communication between the operator and the line follower is allowed. If found the team will be disqualified immediately.

# GAMEPLAY:

- The LFR starts from the start zone (at a time or on their own) and finish at the finish zone after completing the track.
- If there is multiple path to cross a section LFR can take any path to follow.
- While following the line the LFR will face curved lines, round loops, intersections, right angles acute angle, line gaps, bridge, zigzag ,object (2<sup>nd</sup> round).
- It is not allowed for the LFR to bypass any checkpoint. But if team members want it can bypass any portion of the track from checkpoint to checkpoint, but this will provide penalty specified for that portion and a restart penalty.
- Any input from anywhere outside the arena is prohibited.

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# POINTS CRITERIA:

Criteria	Points
Design Bonus	10
Leaving Start Zone	10
Crossing each checkpoint	50
Stopping at the Finish zone	50
Complete without Restart	30
Crossing the Bridge	20
Cave	30

# PENALTY:

Criteria	points
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Design Penalty	5 points / cm
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Restarts	20
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# FINAL RESULT:

Let,

- $S$  = Total Score
- $A$  = Total points earned by autonomous bot
- $T = t$  - total time taken to complete the run
- $P$  = Total penalty
- Therefore,  $S = A + T - P$
- Timer point =  $T$  (total) –  $T$  (calculated)
- Here,  $T$  (total) = the total assigned time in seconds.
- For Primary round, it is 300 and for Final round, it is 420.
- $T$  (calculated) = the total time taken by a team to complete the task.

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# DISQUALIFICATIONS:

- Evidence of disrespecting to competition judges.
- Evidence of disrespecting to security rules.
- Evidence of disrespecting any opponent team mate.

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# FLEXIBILITY:

- **The competition committee can make modifications of the rules at any time, and the committee has full right to change the rules.**



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**\*Contestants would be notified if any rules are updated.**

# LIABILITIES:

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- Participating teams are always responsible for the safety of their robots and are liable for any accidents caused by their team members or their robots.

- The “TECHSURGENCE” organizing team members will never be held responsible nor liable for any incidents or accidents caused by participating teams or their equipment

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***Thank you !***