



Line Follower Competition Rules

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1 Introduction

1.1 Date and time

The event will take place the 22nd of March.

1.2 Place

The event will take place on the TU/e campus: Onze Lieve Vrouwestraat 1, 5612 AW Eindhoven.

2 Participation

2.1 Teams

- Teams will consist of not more than 5 people
- There are no restrictions on who can participate as long as your enthusiastic

2.2 Pricing

We are doing our best to keep the team registration costs as low as possible, however now it is too difficult to say how much it would be. The same is true for the kit, which can be purchased separately. Pricing announced shortly.

3 The Line Follower Robot

3.1 Size restrictions

1. The Line Follower width should not exceed 25cm
2. The Line Follower length has no restrictions
3. The Line Follower height should not exceed 15cm, this depends on the height of the start and finish, tba.

3.2 Power

Total battery capacity may not exceed 10000mAh. There is no limit on the battery voltage.

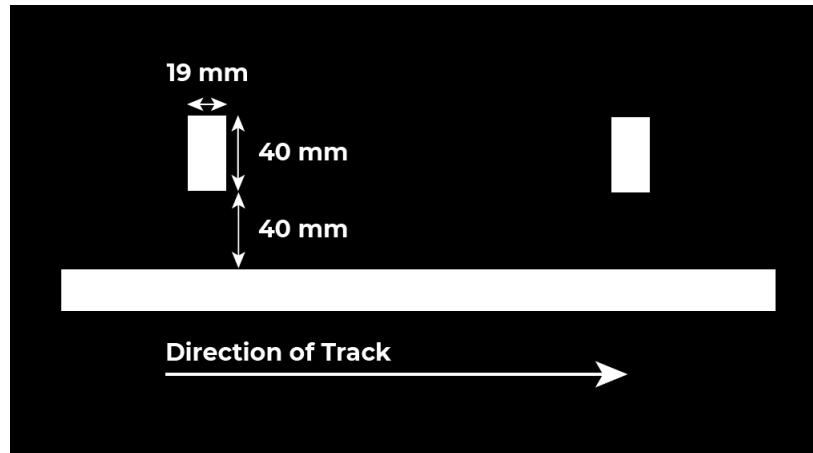


Figure 1: Dimension of track for the start and finish where they are marked by a white marking on the left side of the track

3.3 Control

The Line Follower must be autonomous. Wireless and or wired communication to the robot is not allowed.

3.4 Components

Components that have a risk of harming bystanders are by no means allowed, this is not a battle bot!

4 Track

4.1 Color

The track will be black with white lines.

4.2 Measurements

1. The total track length is approximately ?m.
2. The line which should be followed has a width of 19mm.
3. Markers are 19mm by 40mm and are 40mm removed from the track.
4. These markings are either given on the right side - these indicate the start and finish - or the left side - which indicate the start and end of a corner. These dimensions are shown in Figure 1 for the start and finish and Figure 2 for a corner.

5 Timing

1. The time it takes for a Line Follower to make the circuit of a track shall be the recorded lap time.
2. To determine the lap time of the Line Follower, the period from the time the sensor at the starting line detects part of the Line Follower body to the time the sensor at the finishing line detects part of the body of the same Line Follower shall be clocked.

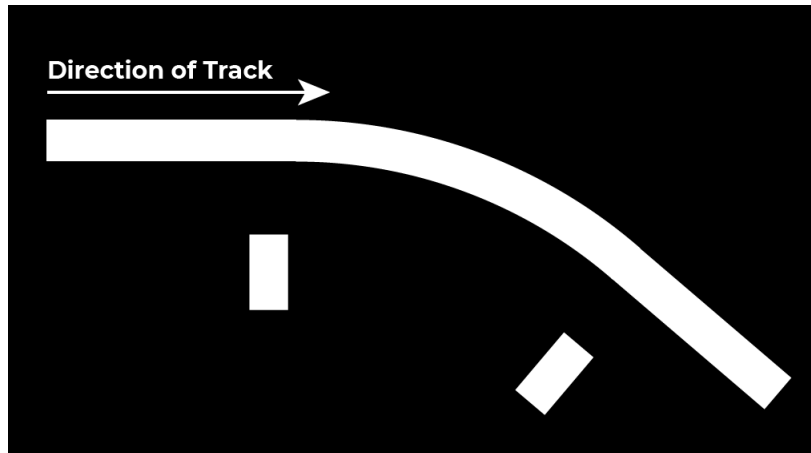


Figure 2: Dimension of track for an arbitrary corner where it is marked by a white marking on the right side of the track

3. The Line Follower has up to 5 attempts (runs) within 4 minutes (the performance time), this will be considered 1 turn. If the performance time limit is reached and the Line Follower is in the midst of a run, the Line Follower will be allowed to complete the run and the lap time will be valid if the run is successful. The fastest time obtained within the performance time will count as the time for this turn.
4. Within the given performance time, the handler is allowed to replace batteries and/or alter program parameters to the Line Follower.
5. Line Followers shall start anywhere within the defined start-finish area, and shall go in the specified direction. After crossing the finishing line, the Line Follower must automatically come to a complete stop, and remain stationary for at least two seconds, failing which a penalty time may be added to the score.
6. If a Line Follower leaves the white line, and has not crossed the finishing line, it will be considered to have gone off the track, and that run shall be invalid. A line follower will be judged to have left the line if, at any time between the start and end markers there is no part of the robot vertically above some part of the line.
7. The organisers will ensure that the track is located within a typical indoor environment in so far as is feasible. No request to adjust the lighting shall be entertained.
8. The organisers may demand from handlers such explanation concerning their Line Followers as is deemed necessary, and they may use their discretion to direct handlers to withdraw their entry, disqualify them, and take any other necessary measures.
9. Once a run has begun, the handler may not touch the robot until the run is complete or the robot needs to be recovered. Touching the robot at any time during a run will cause that run to be disqualified and no time will be recorded.

6 Competition

6.1 Competition

The fastest run within the performance time is recorded.

The competition will consist of two main stages:

1. In-rounds



- (a) Each team will have 4 turns, one for every track.
- (b) Per track, all teams are ranked based on time and are awarded points for this. The fastest team gets n points, where n is the number of teams, the second fastest gets $n - 1$ points, etc.
- (c) Based on these points, the top 8 teams will proceed to the out-rounds.

2. out-rounds

- (a) The top 8 teams will compete in a bracket-style format based on their recorded times.
- (b) This stage includes
 - Octofinals
 - Quarterfinals
 - Semifinals
 - Finals
- (c) At each stage both teams get 1 turn. The team with the fastest time wins and, if applicable, moves on to the next round.

6.1.1 Additional competition

In addition to the time-based competition, teams will also have the opportunity to compete in the following categories:

1. Aesthetic Design: For the most visually appealing and creative robot.
2. Innovative Engineering Solution: For the most unique or effective solution to design challenges.

For these additional competitions, all teams will have up to 10 minutes to present their design and engineering approach to a panel of experts (to be announced), this is presented as "tech talk". Judges will evaluate the presentations and designs to determine the winners of these categories.

6.2 Media Concernt

Pictures and videos will be made during the event. These will be used for later promotion material for future years. If you wish not to be photographed or filmed, please reach out to us and we will ensure the photographers know to avoid you. Unfortunately, this cannot be fully guaranteed.

6.3 Organizer's decisions

1. The organizers reserve the right to make changes to any of the above in the interest of fair play and sportsmanship and to ensure that all competitors have an enjoyable competition.
2. In the event of ambiguity, the organizers' interpretation of any clauses of the rules shall prevail.

6.4 Eating and Drinking

We kindly ask you to comply to the following rules regarding eating and drinking.

1. Drinking and eating is not allowed within the sports hall. We are renting the hall from the Students Sports Centre (SSC) and we want to keep it clean.
 - (a) An exception is made for closed-off drink containers (i.e. water bottles).
2. Drinking and eating are allowed in the following places: the canteen and outside the building. Please do not buy something in the canteen to then consume it in the hall.
3. Alcoholic beverages are only allowed to be consumed in the SSC canteen.



7 Acknowledgments

- UKmars on inspiration for the rules [<https://ukmars.org/contests/contest-rules/line-follower/>]

A Appendix A: Line Follower Lingo

1. *run* - an attempt made by a Line Follower to which ends successfully according to 5.5.
2. *Performance time* - Time you get to complete the given runs (4 minutes for 5 runs)
3. *Turn* - The maximum 5 runs you perform during the performance time.
4. *In-rounds* - The first 4 turns of every team
5. *Out-rounds* - The final 4 turns bracket-style

B Appendix B: Preliminary schedule



Time	22-03-2025	
08:00		
08:30		
09:00	Opening presentation	
09:30	Free practice	
10:00		
10:30	In-round 1	
11:00		
11:30	In-round 2	
12:00		
12:30	In-round 3	
13:00	Lunch group #1	Tech talk group #2
13:30	Tech talk group #1	Lunch group #2
14:00		
14:30	In-round 4	
15:00	Break Announcement	
15:30	Outrounds	
16:00		
16:30	Prize and closing ceremony	
17:00	Network drink	
17:30		
18:00		
18:30		

Figure 3: Preliminary schedule