ROBOCORE®

Line Chaser
RULES

Revised Document 01/12/2023

Line Chaser | Rules

Revised Document 01/12/2023 - Based on the rules defined by the University Network - RUNIBOT (2022).

1. Introduction

- **Game Mode:** Line Chaser
- **Number of Robots per Match:** Two
- **Time Trial Duration:** Check item 5 - "The Time Trial"
- **Available Classes:** Pro
- **Maximum Robot Dimensions:** 200 x 300 x 200mm
- **Circuit Specifications:** Check item 4 - "The Track"
- **Control Specifications:** Autonomous

2. The Competition

The Line Chaser robot category consists of a competition in which two robots must traverse a symmetric track marked with a line in direct competition, with the winner being the first to reach the other end or the one that remains on the track for the longest time.

3. Robot Specifications

3.1. The robots must be completely autonomous and with all components on board. They cannot be externally controlled, except for being started or for parameter adjustments.

3.1.1 To start the competition, it is necessary that the robots have activation and deactivation with the starting module, without direct physical contact. The start of the race is immediate. **There must be no safety time.** For details on this function, see the last part of this document.

3.1.2 The robot parameters, such as speed, acceleration, or any other, can be changed, either by means of switches, buttons, or remotely, as long as the existing software allows it and this is done only between two attempts.

3.2 The robot cannot exceed 200mm in width, 300mm in length, and 200mm in height, and cannot change its dimensions during the time trial.

3.3 It is not allowed to use thrust methods that increase the normal force relative to the ground. Such methods extend but are not limited to turbines, propellers, fans, or suction elements. If the robot has any of these items, they cannot be turned on.

3.4 It is the competitor's responsibility to prove that their robot is unique and the same one used throughout the competition for each registration. It is mandatory that the competitor or the team that has more than one robot registered in the category adopts non-interchangeable mechanical elements that can identify the uniqueness of each robot, such as a mechanical characteristic (color or chassis shape, among others). If the judge deems the differences to be insufficient, only one of the robots will be authorized to compete, and the others will be disqualified.

4. The Track

4.1 Simple track in a maximum area of approximately 8m².

4.2 The track surface is composed of one or more black rubber mats placed on a flat surface, which may have seams. Possible unevenness may occur and will be

minimized as best as possible with black tape on the seams. In any case, the robots must be able to overcome such unevenness (+/- 2mm).

4.3   Complaints about the track's grip will not be accepted, as long as item 4.2 is respected.

4.4   The track is indicated by a white line 19 +/- 1mm wide. The total length of the line will be a maximum of 60m.

4.5   The line consists of combinations of straight lines and arcs.

4.6   The arc radius is at least 100mm.

4.7   The circuit is assembled horizontally, but parts of it may be inclined up to 5°.

4.8   There are no forks.

4.9   There are no markings indicating changes in curvature. The only markings, besides the line that defines the course, indicate the starting point of each robot.

4.10 Continuous path, no discontinuities.

4.11 The line 250mm before and 250mm after the starting points is straight.

4.12 The tones of the line and the track are subject to possible variations, depending on the supplier of the materials used in their manufacture, but there is a great contrast between the white line

4.13 Lighting conditions may vary, and recording equipment and cameras may generate some kind of interference during the competition, so the robots must be designed so that lighting conditions do not affect them.

4.14 Any challenge to the compliance of the track must be immediately notified to the organization, provided that the competition has not started. The organization itself will decide how to proceed.

5.   Competition Development

5.1   The competition takes place in direct contests, one robot against the other.

5.2   The distribution of disputes and the times they occur are determined by drawing lots on the first day.

5.3   Time is set aside for testing and adjustments, as defined and informed on the first day.

5.4   To be eliminated from the competition, the robot needs to be defeated twice, using the double elimination criteria.

5.5   All robots start the competition in a single key of disputes and, after receiving their first defeat, are placed in a secondary key with the other robots in the same condition.

5.6   It is emphasized that the robot that is not defeated until the final match needs to be defeated twice for the opponent to become champion.

6.   Dispute Rules

6.1   The robots start at the predefined starting points indicated by the judges.

6.2   The winner is the one who reaches the other robot or the one who remains on the track for a longer time (considering the possibilities when the other robot leaves or stops).

The judge decides when the victory is imminent, stops the robots, and decides the winner.

6.3 In case of a time-out, the winner is the robot that approaches its opponent the most. In case of doubt, the judge may extend the time.

6.4 The robot must start using the starting module and stop with the same module. If it does not have the module, it cannot compete.

6.5 If, during the competition, the robot does not respond to the stop command and continues moving, even though it is evident that it is not responding to the starting module's commands, it will be disqualified from the competition. This is because not stopping could cause damage to the other robot.

6.6 If a robot does not move, a new start can be made, with the maximum number of false starts being two. In case of 3 (three) false starts by the same robot in the same dispute, the robot that does not present the fault wins.

6.7 The false start is requested only by the competitor, at the same time as the start in less than 5 seconds after the judge's command. If it is not requested according to the instructions, the dispute is valid and cannot be repeated.

6.8 In case of 2 (two) warnings in the same dispute, the victory is given to the opponent's robot.

6.9 If the robot is divided into 2 (two) or more parts, passive or active, during its movement, the victory is given to the opposing robot.

6.10 If the robot activates any pushing method described as prohibited during its movement, the victory is given to the opposing robot.

7. Regulations

7.1 Only two members (an operator and an assistant) of the competing team are allowed to stay in the dispute area.

7.2 For any case, the final decision will be up to the track judge and will be irrevocable.

7.3 Each race will have a maximum duration of 2 minutes, which can be extended by 30 seconds.

7.4 Following the track judge's indications, the teams greet each other, and then the operator positions their robot in the designated location. Similarly, at the end of the dispute, each operator picks up their robot, and the teams say goodbye. Failure to comply with this guidance results in a warning.

7.5 Robot movement before the judge's request implies a warning.

7.6 After 5 seconds of movement, there is no possibility of stoppage request by the teams.

7.7 Maintenance of the robot on the track is not allowed.

7.8 Repairs can be made as long as the robot is not on the track, i.e., while other robots are competing and are from different groups.

7.9 Battery replacement is allowed before the start, already on the track, provided that it does not involve repairs or modifications to the robot and takes a maximum of 10 seconds.

7.10 Adjustments, modifications, maintenance, battery recharges, reprogramming, and other robot changes can be made while it is not on the track.

7.11 Track Judge: There will be track judges who will make the decisions relevant to the competition's development.

7.12 After the call to the track, a maximum waiting time of 30 seconds will be given for the robot's presentation and the start of the competition. If a robot does not appear, the victory goes to the robot that appeared.

8. Penalties

8.1 The following constitute grounds for **expulsion from the event**:

8.1.1 Insulting or attacking members of the organization, as well as other competitors.

8.1.2 Intentionally causing damage to the competition area.

8.1.3 Intentionally causing damage to the facilities.

8.1.4 Intentionally causing damage to the opponent's robot.

8.2 The following constitute grounds for **disqualification**:

8.2.1 Manipulating or controlling the robot externally by any means once the race has started.

8.2.2 Using devices that can cause damage to the track or that prevent the competition's continuity.

8.2.3 Causing damage to the competition area.

8.2.4 Using devices that can cause physical harm to people.

8.2.5 Presenting a robot that is incompatible with the category's specifications.

8.3 The following constitute grounds for **a warning**:

8.3.1 Delay in appearing for the competition after being called.

8.3.2 Incorrect positioning of the robot.

8.3.3 Robot movement before being requested by the judge.

8.3.4 Delay in starting the competition while on the track.

8.3.5 Claims by team members who are not the team captain.

8.3.6 Unauthorized access by team members who are not the operator and/or assistant on the track.

8.4 Judges have the autonomy to warn, disqualify, or expel participants in cases where the guidelines in this document have not been followed.

9. Claims

9.1 The team captain may report possible breaches of the regulations by their opponent to the track judge, provided that they do so before the competition between them begins, with the track judge deciding if the allegation is valid and the applicable sanctions imposed, if applicable.

9.2 Any complaint must be made in a formal tone, with the utmost respect possible.

9.3 The robot must be presented for verification whenever requested by the judge, and if applicable any penalties, the decision must be received by the team calmly.

10. Starting Module

10.1 The recommended modules are designed for robots in the categories: Line Chaser, Mini Sumo Mini (Auto), and Sumo 3kg (Auto) in the main competitions in the world.

10.2 The following options are recommended:

10.2.1 MicroStart Sumo & Minisumo Robot Start Module by JSumo: https://www.jsumo.com/microstart-sumo-minisumo-robot-start-module

10.2.2 Starting Module by Já-Bots: https://ja-bots.com/producto/modulo-de-inicio

10.2.3 Use an infrared receiver properly integrated into the robot's starting circuit that meets one of the above standards.

10.3 In case it is not possible to meet the recommendations above, Bluetooth start-up can be used. In this case, it is entirely the team's responsibility to ensure that their robot does not experience any unforeseen interference during the matches.