LEGO LINE FOLLOWING CONTESTRULES

1. Introduction

This document outlines the rules for the “Lego Line follower” robot competition.

2. Description of the Competition

Line follower robot competitions are exciting and educational events that test the ability of autonomous robots to move as quickly as possible on a track drawn with black lines on a white background. One operator and four helpers can be registered for each robot (there can be a maximum of 5 team members in total). However, only one operator is allowed to guide the robot during the encounter. The robot is expected to follow the line in the direction indicated by the referee and complete the track. The robot is placed at the starting point determined by the referee. During the placement period, competitors are given time for robot calibration. After the robot passes the sensor level, the stopwatch starts to run. When the robot passes in front of the sensor again , the stopwatch stops and the time for the robot to complete the track is determined in this way. Each team has the right to compete in 3 rounds. Times are recorded for 3 laps and the lowest time is considered as the team's track completion time. The winning robot is announced by the referees.

2.1. Fixture

The competition format is determined by the tournament organizers depending on the number of participants. Teams have 3 rounds of 3 minutes each to complete the competition. After all teams participating in the competition complete their 1st Round qualifications, the 2nd and 3rd rounds are held respectively.

2.2. Classification and Rating

Fibonacci International Robot Olympiad Lego Line Follower competitions take care to classify and grade by taking into account education level and age groups. It can be divided into 5 basic groups: kindergarten (0-6), primary school (6-10), secondary school (10-14), high school (14-18) and university (18+). The age group and education level of the team is determined by the age or education level of the oldest member of the team. It is the responsibility of the team **mentor to ensure that teams are registered in the correct age category .** If during the competition it is determined that the team is registered in the wrong age category, the robot of this team will be **disqualified from the competition** .

Note: Teams in the younger age group are allowed to compete in the older age group. The organizers reserve the right to check the age of contestants during the competition. In case of violation, the robot of the team that violated the rules will be **disqualified** .

3. Line-Following Runway Definition

The races will be held on a protected rectangular field of 2.10m x 2.80m square meters, called "Runway". As shown in Figure 1, a route with a width of 2cm±2mm and at least 15cm from the edge of the track has been drawn on the field. The roads are black lines on white. There are 90-degree turns, intersections and arc-shaped turns in some parts of the track. There are black lines intersecting each other on the track, the robot must follow the straight line at these points.

3.1 Starting area

The start/finish area will be specified by the referees and announced to the teams on the day of the competition. IR sensors were used at the edges of the Start/Finish area . The robot passing the sensor starts counting time on the stopwatch. On closed courses, the starting and finishing points will be the same. On open trails, the starting and finishing points will be different.

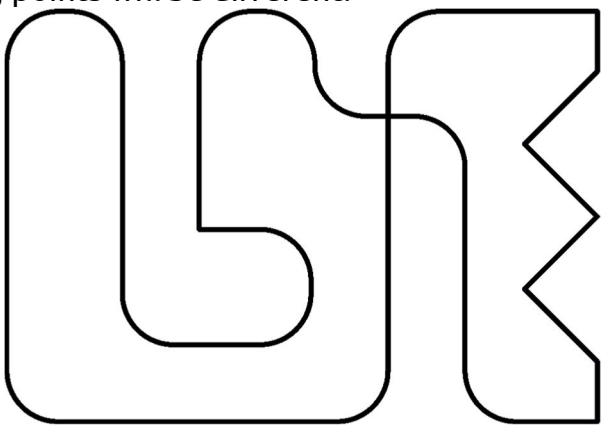

Figure 1: Sample Runway and Dimensions (210x280cm)

4. Robot

4.1 Line follower robots must have a maximum width, length and height of 25 x 25 x 25 cm and a maximum weight of 1000g. The robot must be built only from genuine LEGO® licensed parts and must only use LEGO® recommended batteries. The robot must be at least as high as the stopwatch sensor can see.

Class	Weight	Length*	Width*	Height*
Lego Line Follower	1000gr	25cm	25cm	25cm

Table 1: Size and Weight Limitations

4.2 The robot must not cause damage to the field and the robots must not endanger spectators in any way.

4.3 The remote control can be used to start the robot, after starting the control must be handed over to the scorer's table. However, the remote control is not mandatory.

5. Race Rules

5.1 Competitors must be in the competition area, ready to race, within 3 minutes after the names of their robots are announced. Otherwise, it is considered to have completed its tour.

5.2 Teams are given sufficient time to calibrate their robots before the competitions start. For this reason, objections made due to stage lights, illumination lights, cameras and lighting around the track will be deemed invalid.

5.3 The robots take a tour around the track autonomously. Robots cannot be controlled remotely. The competition will be held against time. The time will be kept with a stopwatch on the track. The stopwatch will start counting as soon as the robot passes the sensor line on the start/finish line. When the robot completes the track and crosses the start/finish line again, the stopwatch will stop counting and finish the race. **It is forbidden for the competitor to interfere with the stopwatch** . Competitors who interfere with the stopwatch are considered not to have completed the round.

5.4 Competitors are given 3 starts in 1 round and are expected to start at least one of them. The robot that starts and starts the timer by passing in front of the sensor , or the robot that does not start for 3 starts, is deemed to have used its right to tour.

5.5 Robots must follow the line in the direction of movement indicated by the referee. The referee has the right to change the direction of robot movement for each round.

5.6 It is essential for robots to follow the line autonomously on the line. If the robot's body is completely out of line, it means that the robot has left the track, and in this case, the referee will give the robot a 5-second penalty point.

5.7 If the robot goes off track, the robot continues the race by being left behind the intermediate starting line indicated by the referee, according to the point where it started. Meanwhile, the time continues to run on the stopwatch. Intermediate starting lines are the lines closest to the point where the robot leaves the line.

5.8 Robots that complete the track perfectly are given 5 second bonus points.

5.9 When the robot passes in front of the stopwatch sensor and finishes the race, bonus points are added to the time on the display or penalty points are subtracted.

5.10 Each team competes in 3 rounds and the lowest time in 3 rounds is recorded as the team's score. Ranking is created based on these scores. If the points are equal, priority is given to the team that did not receive any penalty points. The ranking is created by measuring the weight of the robots with equal penalty points.

5.11 The contestant called for the competition is not given testing, repair and maintenance time.

5.12 It is forbidden for the competitor to damage the sensor or affect its working principle by interfering with the sensor , and the team that interferes with the sensor in this way is deemed not to have completed the tour. The sensor is started and stopped only by the robot.

6. Objections

The juries' decisions are final and not subject to subsequent review. If a solution cannot be reached with the juries, objections must be submitted immediately to the Fibonacci International Robot Olympiad Chief Referee. Complaints made after this point will not be accepted. In case of disagreement or disagreement, the final decision will be made by the Juries and/or organizers.

Note: Rude behavior will not be tolerated. A team that does not respect the decisions of the judges, referees or referees may be disqualified by the referee and/or event organizers.

6.1 Competitors cannot raise objections due to field factors after the round has started. These factors are eliminated by the referees with warnings made before the round.

6.2 The competitor may make a verbal objection to the referee for the result of a round after that round. When the next round begins, the contestant loses his right to verbal objection.

6.2.1 The contestant may present the evidence he/she has to the referee within the scope of the objection. The referee can decide according to his own logic when there is a situation outside the rules.

6.2.2 After the rounds are over, the contestant may submit a written objection to the verbal objection decision until the next round begins. This objection must be written and submitted to the chief referee in the form of a petition .

6.2.3 The chief referee makes final decisions on the objections made. Decisions cannot be appealed again.

6.3 Competitors who do not comply with the referees' warnings or disrupt the course of the competition will be disqualified.

6.4 Fibonacci robot competition reserves the right to make any changes it deems necessary in the rules.

7. Marking Robots

Robots must be checked by the referees before the tournament and their number labels (Robot Number / Team Their IDs should be labeled with). These stickers are provided by the competition organizers. The sticker cannot be placed on the robot or any other component that could interfere with the operation of the opponent's sensors . Before each new tour, robots must undergo technical control again.

8. Changes and Cancellations of the Rules

Changes and cancellations in the specifications are made by the main organizer of the competition in accordance with the regulations of the competition organizing committee.

9.Safety Precautions of the Competition

Class	gloves	Glasses
Lego Line Follower	Not Required	Not Required

Table 2: Security Requirements

9.1. It is not mandatory for competitors to wear protective gloves and protective glasses during competitions. The mentioned protective equipment will be loaned to the competition if the competitor does not have it, but it is recommended to bring your own equipment for hygienic reasons.

9.2. Competitors will not be allowed into the competition area with any electronic device (e.g. phone, tablet, RF remote control).

9.3. Robots with swollen batteries and leaked fluids cannot be raced. If dangerous situations such as short-circuiting or smoke are detected in a robot during the competition, the competition will be stopped and the robot will be disqualified.

10. Disclaimer

In the Lego Line Follower Category, if the robots go off the track, the contestant is expected to pick up the moving robot and place it at the intermediate starting point, and the contestants are required to work carefully and take the necessary precautions at every stage of the competition. Despite this, Fibonacci International Robot Olympiad Organizers disclaim all liability for any material damage or injury that may occur .