

ROBORUSH

Introduction

In a world full of accidents and tragedies, an apparent fallout of the recent technology explosion would naturally be driverless cars. They are poised to dominate our future roads and rails. The fact that most major research firms in automation are, at some level, thinking of automating travel testifies this trend. Inter-vehicle communication, image processing and position sensing are key to achieving this. A scaled down version of this scenario is presented in this contest.

There would be two rounds in the contest, the first of which would consist of an autonomous car traversing a circuit, avoiding stationary obstacles. The second round would consist of an extremely exciting race between two autonomous cars, in a tournament fashion, which would involve dodging both stationary and moving obstacles, real-time lane shifting and a whole lot of fun!

Event Format

Problem Statement:

A basic line follower event for beginners in robotics. However the bot not only has to traverse a black line on a white background, but has to negotiate through obstacles, determine the correct path and compete with other bots on a race.

Prelims:

The arena will have 3 parallel tracks which are indicated by lines of width 3 cm. The designed track might consist of straight lines, smooth curves and sharp turns. The track is mostly a black line on a white background but will have inversions in some areas (see the sample arena figure given below) . The distance between any two adjacent tracks will be 30 cm. Obstacles (5cm x 5cm x 10cm painted white) will be placed on each track. The bot will have to evade the obstacles and navigate to the end of one of the tracks. A bot may be asked to start on either the leftmost or the rightmost track. The participants must be able to specify this input dynamically (e.g.: using switches).

Finals:

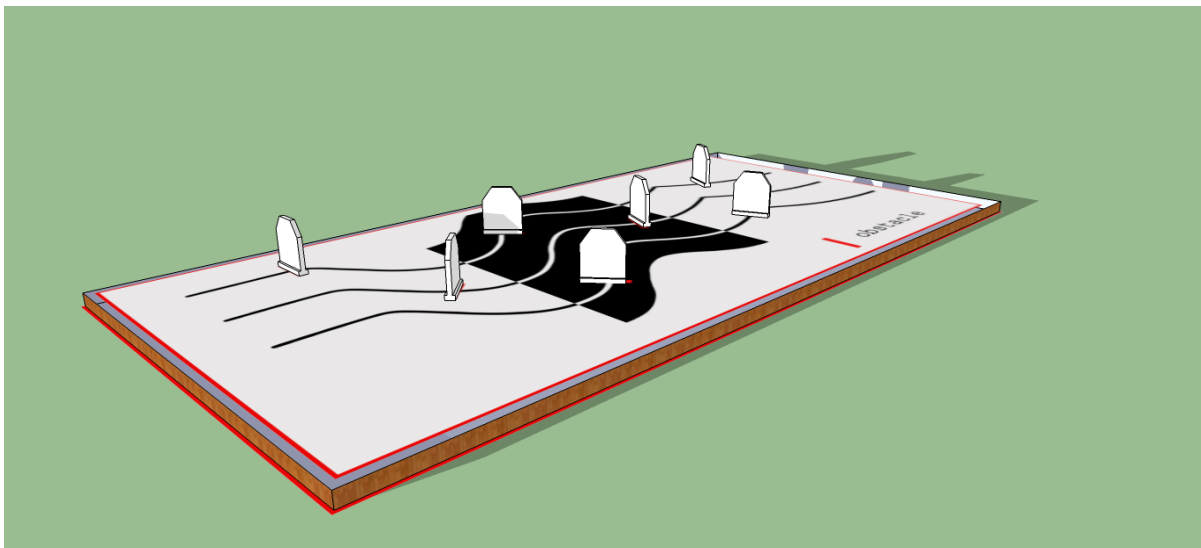
A knock out tournament will be held between the 8 teams who qualifies to the final round. At each round two bots will compete to reach the next level of the tournament. One bot will start on the leftmost track and other on the rightmost track. The participants must be able to specify this input dynamically (e.g.: using switches).

Bot specifications:

1. The robot should be completely autonomous.
2. The robot should fit into a box of dimensions 20cm x 20cm x 20cm.
3. The maximum voltage between any two points on the robot should not exceed 12 volts.
4. Hard coding of the bot at any point of time will lead to disqualification of team.
5. Readymade sensor modules for line following and/or obstacle detection can be used.
6. The robot directly or indirectly found damaging the arena will be disqualified immediately.
7. The Robot should be covered in white, atleast on three sides (Left side, Right side and at the back).

Arena specifications:

1. Width of all lines: 3 cm.
2. The designed track might consist of straight lines, smooth curves and sharp turns (till 90 degrees) and the track is a black line on a white background.
3. Sample Arena



Rules and Regulations

Competition rules:

1. All teams will be given a calibration time of 10 minutes.
2. During a trial, the machine will have to be restarted by putting it back on the start zone. For a trial, the machine will have to be in Power Off mode and turned on again at the start zone on the signal of the judges.
3. Between trials, participants may not feed information
4. A bot may be asked to start on either the leftmost or the rightmost track. The participants must be able to specify this input dynamically (e.g.: using switches).
5. Each team is allowed a maximum of 5 trials. All trials require the approval of the presiding judges before the machine. However, participants are allowed to: Adjust sensors (Gain, Position etc.), Change speed settings and Make repairs. However, a participant may not alter a machine in a manner that alters its weight (e.g. removal of a bulky sensor array or switching to lighter batteries to get better speed). T Maximum time given for one trial is 10 minutes.
6. The starting procedure of the robot should be simple and should not involve giving the machine any manual force or impulse in any direction.
7. The judges shall arbitrate. The points earned by the team till that time will be retained.
8. Participants will not be allowed to handle the obstacle positions on the track. Only event managers are allowed to handle the obstacles.
9. Participants are not allowed to keep anything inside the arena other than the machine.
10. If robot or participants interrupt other robot while competing, Then there is a penalty for that team.
11. The judges may stop any robot at any time if they feel that it is performing, or is about to perform, any action that is dangerous or hazardous to people or equipment. No robot is allowed to use any flammable, combustible, explosive or potentially dangerous processes.

General Rules:

12. The time measured by the organizers will be final and will be used for scoring the teams. Time measured by any participant by any other means is not acceptable for scoring.
13. In case of any disputes / discrepancies, the organizers' decision will be final and binding.
14. The participants are requested not to assume anything without discussing with the

event managers.

15. The organizers reserve the rights to change any or all of the above rules as they deem fit.

Team composition:

16. Maximum of 3 participants per team.
17. No person shall be a member of two teams.
18. Maximum of eight teams will be shortlisted for the finals.
19. A team can constitute of member from different colleges.
20. Other details regarding the arena can be clarified directly with the event managers.

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