THE FOLLOWING

"The mind has skill, but it has no intelligence; it has a functional utility, but it has no awareness. It is a Robot…" Humans make mistakes while following the track to his dreams and desires but can your bot reach its destination the fastest without making any mistakes, then you can test it here as this year Phoenix presents to you the Line Following with dual colored lines to check your bot's artificial intelligence.

Problem Statement:-

Build an Autonomous line follower robot that is capable of detecting right paths and which can also follow the line even when it is broken (i.e. Line not present for small instance) and also when there are complementary lines and turns.

General Rules:-

- The robot has to be placed on the arena before the event commences.
- A team can consist of maximum 4 members.
- No person can be in two teams of the same event.
- The team members can be from different institutes or colleges.
- The run shall start from a predefined starting zone.
- Damaging the path will lead to immediate disqualification.
- If a team wants a restart or time out, they can do so but each will lead to a penalty.
- A team can have maximum of three restarts.
- After every restart, the bot will be placed at the starting point.
- After every time-out, the bot will be placed at the last traversed check-point.
- The decision of the event coordinator(s) will be final and binding.

Event Rules:-

This event is divided into 2 rounds.

Preliminary Round:-
Task: In the preliminary round the robot has to move along a path. In the prelim round there will be **white line on a black background** .Once the bot starts it will have to follow the line. There will be gaps of 4cm (i.e. no lines present on the arena) on the path and the robot has to go straight and catch the line which starts just after the gap without any wall to detect beside the path. Also there will be another specification i.e. the line which will be followed by the bot may cross over perpendicularly over previous lines (a white line over another white line previously followed by the bot). Maximum time of completion of the task will be 5 minutes.

General Arena Specification:-

➢ There will be a circular white start spot for placing the bot. (this will fit the maximum dimension of the bot described later)
➢ The Line will be 2cm thick.
➢ The small gap between the main paths of the bot is 4cm without any wall to detect beside.
➢ There will be a circular white stop spot (this will fit the maximum dimension of the bot on which the bot should stop.

Scoring:-

➢ Points will be awarded for successfully crossing each checkpoint.
➢ Points will be awarded for reaching the end point.
➢ Extra credit will be awarded for successful stopping at least for 3 seconds at the end point 'STOP'.
➢ Credit will be given for each correct turning.
➢ Credit will be given for successful passing through gap between lines
➢ Penalty will be deducted for each restart (maximum three).
➢ Penalty will be deducted for each time out (maximum five).
➢ Penalty will be deducted if the bot fails to pass through gap.
➢ Penalty will be deduced if the bot fails to pass through overlapped line.
➢ Penalty will be deducted from the total score.

Final score:- 400- (Time taken in seconds) + 30* (Time in seconds to overcome gap) + 50* (number of check points crossed) +20(for stopping at end point for 3 seconds) - 10*(no of resets) - 20*(number of restarts).

Sample Schematic:
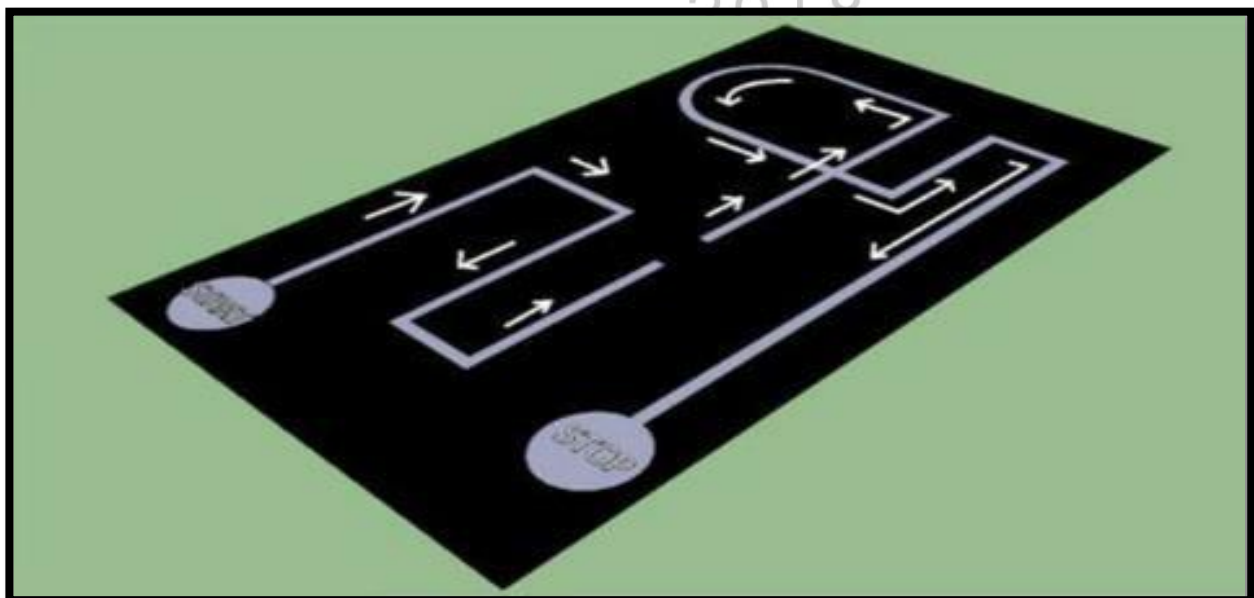
Final round:-

Task: In the final round the robot has to perform the task of the preliminary round. In addition to that there will be gaps that will not be in accurate straight line with the previous broken line. There will be complementary lines i.e. there may be white lines on black background mixed with black line over white background and the robot has to traverse through it and when the path is just started to complementing in color the robot must make a signal visible to the coordinator (it may be indicated by a LED blink or LCD display etc.). Maximum time of completion of the task will be 8 minutes.

Scoring:-

- ➢ Points will be awarded for successfully crossing of each checkpoint.
- ➢ Points will be awarded for reaching the end point.
- ➢ Extra credit will be awarded for stopping at least for 3 seconds at the end point 'STOP'.
- ➢ Credit will be given for each correct turning.
- ➢ Credit will be given for successful passing through gap between lines.
- ➢ Point credit will be awarded if the bot indicated the starting the successive complementary line over complementary background.
- ➢ Penalty will be deducted for each restart (maximum three).
- ➢ Penalty will be deducted for each time out (maximum five).
- ➢ Penalty will be deducted if the bot fails to pass through gap.
- ➢ Penalty will be deducted from the total score.

Final score:-

400 - (Time taken in seconds) +30*(time in seconds to overcome gap) + 50* (number of check points crossed) +20(for stopping at end point for 3 seconds) - 10*(no of resets) - 20*(number of restarts) + 50(for successful indication of complementary path through some signal)

PS: All rules are subjected to change without prior information. The decision of the event coordinators will be final in regards to all the issues pertaining to the event.

Event Coordinators

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