



March 2nd to 5th, 2020

TRACK-O-BOT

Introduction:

Autonomous bots require to perform many interesting and complex things and in places where normal human exploration is limited or impossible. However, the most basic requirement for any autonomous robot is to navigate properly and reach its destination. In this event your bot will be tested to do just that, to navigate through a city plan containing crossings, dead end at walls and barriers.

Objective:

The robot has to follow a black line over a white background as well as a white line over a black background or both and successfully reach the finishing point from the starting point without being manually controlled by any person. The entire path of the robot consists of walls and obstacles. Depending on the level or round, the robot may have to indicate the walls and obstacles and stopping positions by simply glowing different LEDs. A robot failing to follow the line, and wandering away or falling off the board in any of the rounds will have to start from the last detected checkpoints. Marks will be awarded for successful detection and crossings. Penalties will be imposed for touching the walls and barriers and not stopping in the finishing point.

Robot Specification:

- The robot should fit into box of dimension 25cm X 25cm X 25cm.
- The dimensions may however exceed after the beginning of the run.
- The Bot must be fully autonomous, i.e. No manual intervention is allowed once the run is started.
- LEGO kits or its spare parts or premade mechanical parts are not allowed.
- Readymade gearboxes, sensors, metal detectors, development boards can be used but no other part of the robot should contain any readymade components.



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Event Rounds:

There are three rounds in this event.

- **Round-1**
- **Round-2**
- **Round-3**

Event Rules:

- This is a tentative arena ,the path to be followed will be curved and the arena will be subjected to change .But the overall dimensions will be same.
- The blue parts are walls of white or balck in colour of height 30cm.
- A robot will be allowed a maximum of 3 restarts.
- Before starting the round, participants can test their bot in a separate arena (Given at the end of this document).
- However,7mins calibration time will be given on the final arena after which no other requests for test-run will be entertained.
- If the robot fails to follow the line/falls of the arena or requests restart, the robot has to start from its last fully passed and detected checkpoint.
- A team can consist of maximum of five students.
- A single participant can be present in only one team.
- Each member of the team must bring their own college ID cards.
- Teams will require registering themselves in the registration counter before they can participate in the event.
- Round 1 will be evaluated on scores .Team having scores higher than cut-off marks will be getting entry into next round.
- Blind turn i.e wall follow can be skipped, with negative marks.



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Arena Rules:

- o Width of the central line is 3cm.
- o Central line and background will have a sharp contrast. Central line will be black in colour on white background or vice-versa or both.
- o Each Team has to pre-register their bots to get verified with the bot dimensions and get a bot ID. This step is compulsory and any team skipping this step will be immediately disqualified.
- o Any kind of damage to the arena or any action leading to the discolouration of the arena will lead to immediate disqualification.
- o **Round 1** arena is given below, the paths shown are tentative.
- o **Round 2** arena is also given below, the paths shown are tentative.
- o **Round 3** arena will be disclosed during the event.

SCORING:

Scoring Points

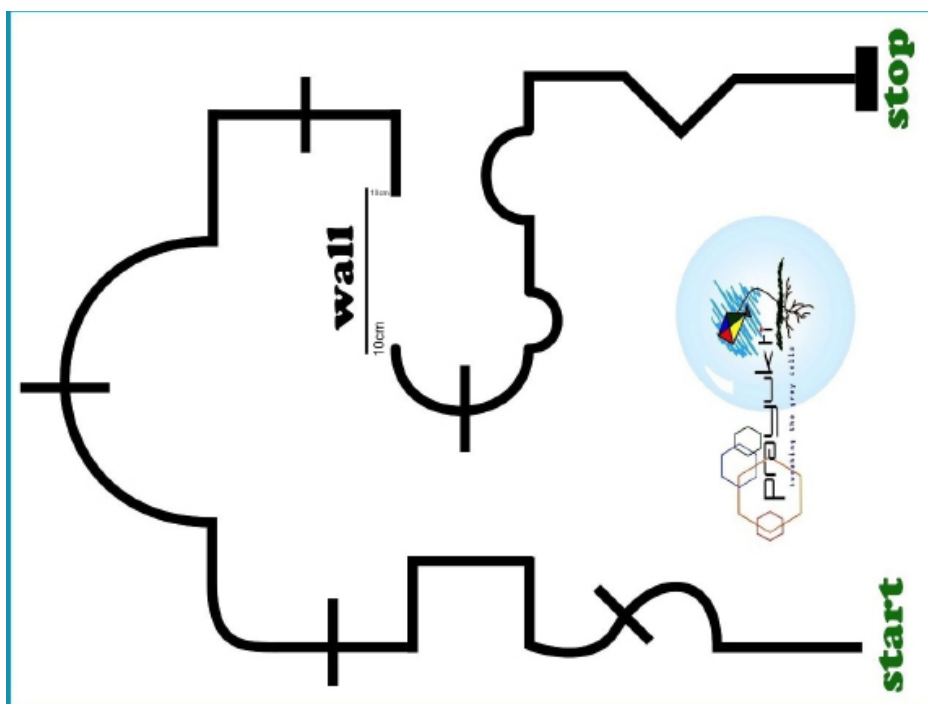
+50
+30
+75
+100
+100
-20
-30
-40
-100
-80

Achievement

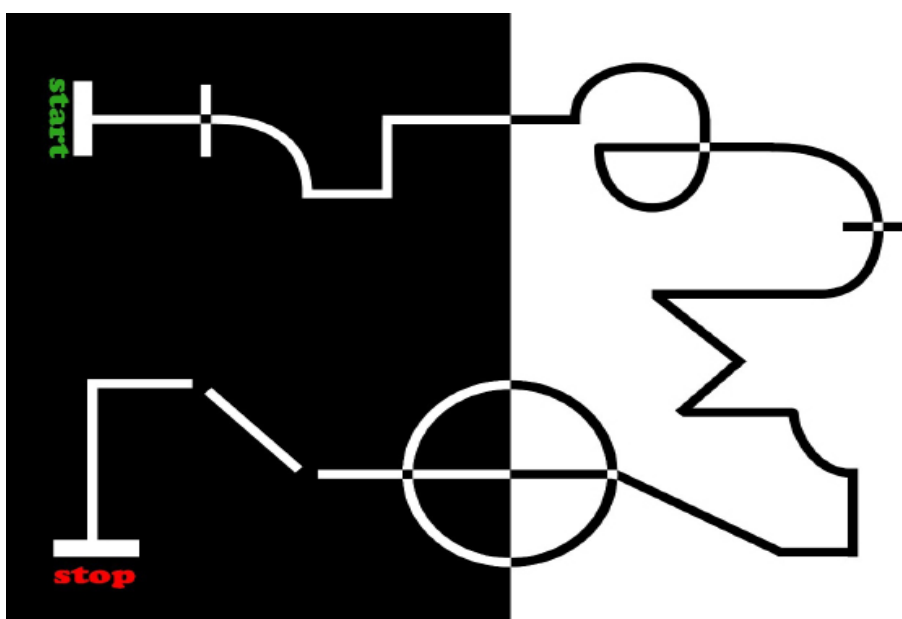
For each successful turn.
For each successful detection of crossing.
For each successful avoid of obstacle.
Bonus for stopping at the end.
Bonus for successful wall follow.
For first restart in each round.
For second restart in each round.
For final restart in each round.
For any hand touches.
For unsuccessful wall follow,

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Arena for 1st Round



Arena for 2nd Round:



Arena for 3rd Round:

Round 3 arena will be revealed on the spot (Hint: maze solver)