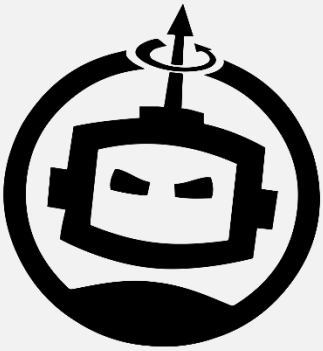


WAYABOTZ 22

Presented by ESOC and IEEE Student Branch of Wayamba University of Sri Lanka

Robotics Competition Technical Specifications

The task

- The main task is to build a line follower robot.
- The robot must be able to follow the black lines on white surface specified by the organizers, which may include some intersection lines, zig-zags, curved lines, and some obstacles as well.
- The robot will have to navigate several obstacles while following the line. The robot must be capable of identifying and removing those obstacles using the horizontal sliding arm. (There should be a notification once the obstacle is spotted). **-Please find the instructions for the guidelines under the robot specification section-**
- The robot will have to indicate the number of obstacles detected by the robot while the real-time task.
  Note: No of obstacles < 7, You can use your own representing method.
- The robot that overcomes all the obstacles in the least time duration, fulfilling the evaluation criteria wins the competition. (Please refer the judging & evaluation criteria section).

The teams will be given an opportunity to test their robot in the prototype arena. The necessary information will be notified via email in due course.

The entire Competition consists of two rounds.

Round 01 :

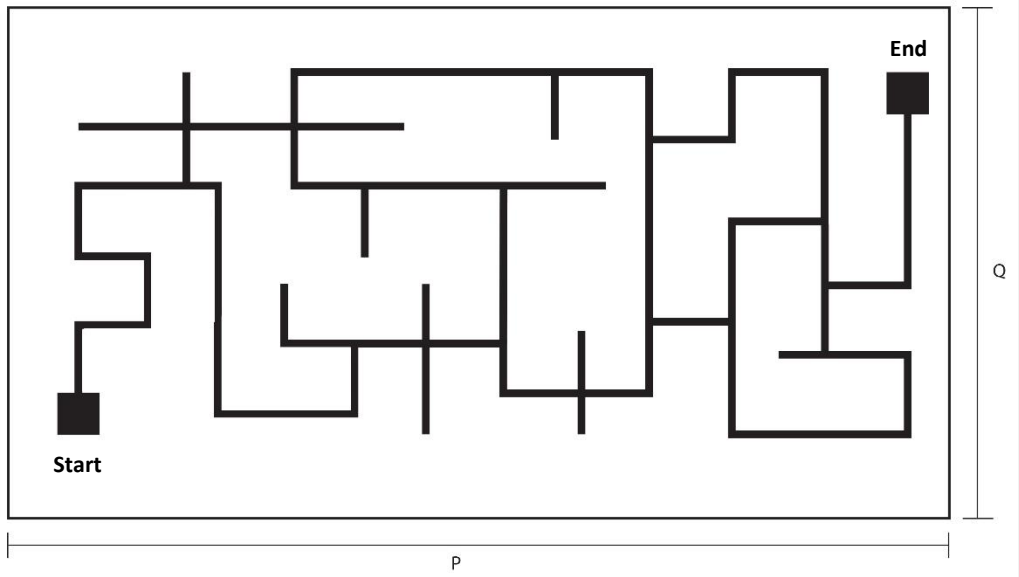
In this round, all robots have to solve a line maze containing black lines on a white surface specified by the organizers. There are not any obstacles & also line maze consists of only 90-degree angles. According to the time taken by the robots, we'll select ten robots for the second/final round.

Round 02 :

In this round, selected robots have to solve the entire arena consisting of obstacles. The robot that overcomes all the obstacles in the least time duration, fulfilling the evaluation criteria wins the competition.

Arena Specifications

Arena top view (2d)



P = 400 cm

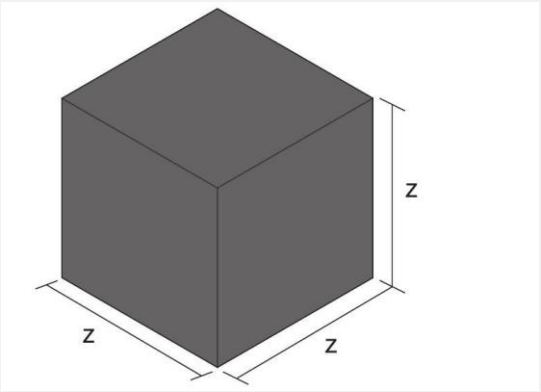
Q = 220 cm

This is a prototype sketch of the arena

Line Maze Specifications

- White squares measuring 35cm x 35cm mark the starting and endpoints of the line maze.
- The maze is made up of 40mm (±3mm) wide Black lines on a White- surface.
- At the turning points, all turns are at a 90-degrees
- A line segment is at least 45cm long.

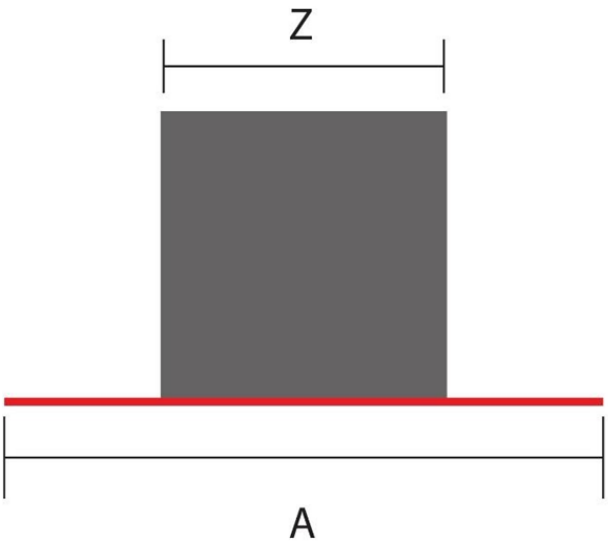
Obstacle 3d image with dimensions



Z–30mm

Mass of the obstacle <= 50g (Grams)

How obstacles can be on the line



A = 50mm

Z = 30mm

Obstacles can be placed on the line

Allowed

Allowed

Allowed

Allowed

In Detail Robot Specifications

- With their arms at rest, the robot truck's dimensions should not exceed 25 cm × 25 cm (width x length). Robots that do not meet these requirements will be disqualified.
- The robots should be entirely autonomous, without any sort of remote control.
- The robots should be powered by Internal power sources. It is not permitted to use external power supplies.
- The voltage difference between any two points on the robot must not exceed 24 volts.
- When an obstruction is spotted, a green LED symbolizing the obstacle detection should light up on the moving robot.
- A red LED should light up after the robot has completed its task. This will be the timekeeper.
- Except for preconfigured microcontroller boards, sensor modules, and other electronic modules, no off-the-shelf Lego kits or other similar assemblies are permitted.
- The robot's startup technique should be straightforward and should not include any manual force or impulse in any direction.
- Between the moving and aiding robots, any communication technique is permitted. The team must ensure that communication is not disrupted and that devices in the environment are not harmed.
- The robots must be able to function in the given indoor lighting conditions.
- Since the entire arena cannot be built on a single board, there may be slight height discrepancies at the boundaries of the board. (Length and width)
- The minimum distance between the arena's edges and the centre of the lines will be 30 cm. The robot must be built so that it does not tumble out of the arena.

Rules

- A robot must be fully autonomous after it crosses the starting line; failure to achieve the conditions will result in disqualification.
- Preconfigured robots are not permitted in the competition, if a team uses any preconfigured robots, they will be disqualified.
  [For example, the Lego kit cannot be used]
- The robot should not damage the track.
- The participating teams must equip themselves with power suppliers.
- The power supply must be installed on the board.
- The robot must fit into the specified dimensions.

Length	Width	Height
25 cm	**25 cm**	**25 cm**

Team Specifications

- The competition is open to schoolers and undergraduates. Participants must represent a specific educational institute. (School/university)
- Contestants must participate in teams. Each team can have a minimum of 3 members & maximum of 6 members. Students from different educational institutes can form a team.
- All the contestants who have a valid identity card issued by their respective educational institution are eligible to take part in the competition
  - University participants should have valid student identity cards from their respective universities.
  - School participants should have valid National identity cards issued by the government.

NOTE: If any team use forged documents to register then that team will be disqualified to take part in the competition.

Judging and Evaluation criteria

- Judges have the authority to demand an explanation of any mechanism on the robot, and defaulters of any type will be disqualified immediately.
- Judges may request to review the bot's code for hard coding.
- Penalties will be applied for mobile controlling (Wi-Fi, Bluetooth modules) or other whole preconfigured items.

- **The final judging criteria will be announced on the day of the competition.**

  Points are awarded for:

  - Time taken to complete the whole task. (Essential: A red LED should light up after the robot has completed its task. This will be used as the timekeeper.)
  - Detecting obstacles
  - Gathering obstacles to the truck
  - Recording the exact number of obstacles at the endpoint
  - Unloading the obstacles to the box placed near the endpoint
  - Robot’s stability (how smooth the robot completes the journey)
  - Weight.

Note: We’ll arrange two technical meetings after the whole registration is completed.

***Team leaders will be notified of any changes via email & WhatsApp.**

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