# MAZE SOLVER CHALLENGE

July 25 - July 27

The challenge is to build a small self-contained autonomous robot (Micromouse) to navigate a maze in the shortest possible time. The Robot which will start on the START tile and reach the FINISH tile in the shortest time will be nominated as the winner.

- **200 Teams** to participate in Maze solver Challenge.
- All participants will get a certification of Participation from **All India Council For Robotics & Automation (AICRA)**.
- **INR 1,00,000** to be awarded to winning teams.
- **Eligibility Criteria:** Entry is open for all age groups below 30.

## How to Get on MazeSolver Challenge

A match is played by a **single team** in one go, with each team consisting of **1 Autonomous Wireless Bot**. An individual may participate or construct a team of a minimum of **2** and a maximum of **10** members. Any institution (School/College/University/Vocational Institution) or group of students (within defined age), may form a team.

- **STEP 1:** Register your RoboClub or Institute as TechnoXian RoboClub online at official TechnoXian website. If you do not have Club or Institute, you may form a new TX RoboClub by introducing minimum 5 members. Registered individual TechnoXian member can also participate in RoboRace challenge.
- **STEP 2:** Once your RoboClub is active, you may select MazeSolver Challenge category from the competition list in your login panel, and apply. You will also be needed to select members from your club who would participate in challenge. Maximum 10 members in 1 team can participate. A club can apply multiple teams for the same challenge.
- **STEP 3:** Construct a wireless autonomous Bot. Ready-made bots will not be allowed to compete. Only self-made or TechnoXian listed DIY kits can be used to make bot.
- **STEP 4:** Prepare a **video** of **1** minute to **5** minutes (maximum 100 MB), showcasing team readiness, creativity, preparing for challenges, or anything to show passion to participate in TechnoXian. Share the video either on email at **videosubmission@technoxian.in** (as google **drive** or **V transfer**) or **WhatsApp** at **+91 8924934336** mentioning Your Team Registration ID. All videos will be uploaded on TechnoXian YouTube channel.
- **STEP 5:** Receive an Invitation Letter from TechnoXian to participate in particular challenge.

## Maze Solver Bot

The participating bot (Micromouse) must be wireless and autonomous. Any robot kit or building material may be used if the bot fits inside a box of **15 centimeters leangth**, **15 centimeters wide and 15 centimeters hight** at any point in time. It can be circular / Rectangular in style. Bot must. Maximum weight should not be more than **5Kgs** including battery, however, a tolerance of **5%** in weight is acceptable. Also the design and construction are primarily the original work of the team. Participants need to ensure:

- The Micromouse must be controlled autonomously with no human aid. A MicroMouse shall not use an energy source employing a combustion process.
- A MicroMouse shall not leave any part of its body behind while navigating the maze.
- A MicroMouse shall not jump over, fly over, climb, scratch, cut, burn, mark, damage, or destroy the walls of the maze.

- No wireless communication between bot and operator will be allowed. Bluetooth, RF Module, etc not allowed on bot.
- The controller unit should be embedded in the robot and cannot be placed outside the robot.
- The robot must be powered by a power source such as a battery fixed on the robot. It cannot be powered by a stationary power source connected to the robot by a cord.

## The Field ( Arena )

- The COMPETITION FIELD consists of **24X24 SqF**. The walls of the maze are 10 cm high and 1.8 cm thick (assume 5% tolerance for mazes). The maze comprises up to **22X22 SqF**, for a total maze size of up to 484 SqF (assume 5-7% tolerance for mazes). The outside wall encloses the entire maze.
- The sides of the maze walls are white, the tops of the walls are red, and the floor is black. The maze is made of wood, finished with non – gloss paint.
- **WARNING:** Do not assume the walls are consistently white, or that the tops of the walls are consistently red, or that the floor is consistently black. Fading may occur; Parts from different mazes may be used. Do not assume the floor provides a given amount of friction. It is simply painted plywood and may be quite slick.
- The maze floor may be constructed using multiple sheets of plywood. Therefore, there may be a seam between the two sheets on which any low hanging parts of a mouse may snag
- The start of the maze is located at one of the four corners. The start square is bounded on three sides by walls.
- Multiple paths to the destination square are allowed and are to be expected. The destination square will be positioned so that a wall hugging mouse will NOT be able to find it.
- **Note:** Actual track design may vary from the one shown in the image below and subject to change before the event commence.

There will be two rounds in Fastest Line Follower gameplay i.e. **Elimination round** and a **Final round.**

- **Elimination Round:** This round would have total 6 minutes time period. 5 minutes for gameplay and 1 minute for bot readiness. Referee would allocate starting point randomly from where team have to start the bot. Team can select left or right hand algorithm by switching mechanism on the bot. **Top 30 teams will be selected for Final Round** who will reach fastest to finish line.
    - No penalty in elimination round.
    - Within 6 minutes, team can have maximum 3 trials. Bot starts from starting point and reaching to finish point will be counted 1 trial. Fastest trial (Run Time) will be considered for next round qualifying. Once micromouse reaches to finis line, time will be paused for next trial if needed.
    - In elimination round, maximum 3 touch are allowed. Means if bot stuck in the wall or at the corner and unable to move then team can adjust the bot from stucking. (Note: Bot direction will remain same). During touch, minor hardware issue can also be fixed but maximum 30 Sec. will be allowed for repairing.
    - 3 Times bot rotation is also allowed. Means if bot stuck anywhere than team can change the direction of the bot in any direction but the position of bot will remain same.
    - After the maze is disclosed, the operator shall not feed information on the maze into the MicroMouse however, switch positions may be changed for the purpose of

changing programs within the robot (changing algorithms is allowed. Entering info on the maze is not allowed and does not constitute “changing algorithms)
    - The illumination, temperature, and humidity of the room shall be those of an ambient environment. (40 to 120 degrees F, 0% to 95% humidity, non-condensing). Do not make any assumptions about the amount of sunlight, incandescent light, or fluorescent light that may be present at the contest site.
    - Every time the robot leaves the start square, a new run begins. If the robot has not entered the destination square, the previous run is aborted. For example, if a robot re-enters the start square (before entering the destination square) on a run, that run is aborted, and a new run will be deemed begun, with a new time that starts when the starting square is exited.
    - The judges reserve the right to ask the operator for an explanation of the MicroMouse. The judges also reserve the right to stop a run, declare disqualification, or give instructions as appropriate (e.g., if the structure of the maze is jeopardized by continuing operation of the robot).
    - A contestant may not feed information on the maze to the MicroMouse. Therefore, changing ROMs or downloading programs is NOT allowed once the maze is revealed. However, contestants can Change switch settings (e.g. to change algorithms. for example from left-turning to right turning – again, entering data on maze size or content is NOT inclusive of this rule), Replace batteries between run, Adjust sensors, Change speed settings, Make repairs.
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- **Final Round:** This round would have total 10 minutes time period. 8 minutes for gameplay and 2 minutes for bot readiness. Referee would allocate starting point randomly from where team have to start the bot. After getting the starting point, team can select left or right algorithm by switching mechanism on the robot. Top 3 teams (1st, 2nd and 3rd winner) will be selected as winner based upon crossing full track in minimum time.
    - During final round, team can opt for maximum 3 trails. Shortest time will be considered for winning position.
    - Maximum 3 touches are allowed but for each touch 10 sec. will be added in bot reaching time.
    - Maximum 3 bot rotation are allowed but for each rotation 15 sec. will be added in bot reaching time.
    - Maximum 30 sec. in 8 minutes gameplay can be allocated by referee, if there is any requirement to fix hardware related issue. Time will be paused for 30 sec.

**Team Members & Mentors:**

- Minimum 2 members and maximum 10 members are allowed in each participating team. Multiple teams from same school/college can participate in the competition.
- Different Teams from the same school/college must use their own individual robots for the competition.
- It’s not mandatory to have coach for each team but a team can have a coach (only one) from the school or outside as a technical advisor.
- The coach will be seated in a supervisory position around the competition area and is not allowed to touch or repair the robots during the competition
- The coach should not be involved in the launching of the robots as this may lead to disqualification
- The robot must follow the design specifications provided. Any deviation from the mentioned specifications will lead to disqualification.

**Fair Play:**

- Robots that cause deliberate interference with other robots or damage to the field will be disqualified
- Humans that cause deliberate interference with robots or damage to the field will be disqualified.
- It is expected that the aim of all teams is to play a fair and clean game.

**Behavior:**

- Participants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.
- The rules will be enforced at the discretion of the referees, officials, and local law enforcement authorities.

**Organizing Committee:**

- The organizing Committee is a union that consists of few communities and associations. The organizers of this competition are **All India Council For Robotics & Automation (AICRA)**.
- All decisions about scoring, game play and timing are made by the juries. Teams should completely respect their vote and decisions. Members of the jury will be from different fields of the robotic science.