

RoboQuestSr



Overview

In disaster rescue missions and exploration tasks, robots are often required to navigate complex environments such as underground tunnels, collapsed structures, and hazardous zones. These environments contain narrow paths, obstacles, and multiple routes that require intelligent navigation.

To simulate such real-world challenges, Kr8ivity League introduces the Maze Solver Challenge, where participants design robots capable of navigating through a maze arena efficiently and reaching target zones.

This competition tests participants' skills in robot design, navigation strategy, control systems, and problem-solving.

The competition consists of multiple stages, each with distinct objectives

1. **Mentoring Round:** A mentoring session will be held for all participants via ablskool.com (LMS) to understand more about the event and rules. Interested participants can also opt for Online mentoring (Optional) to refine their projects with expert guidance.
2. **Zonal Round:** The participants should build a remote-controlled robot (Lego kits or readymade robots not allowed) and complete the maze in minimum time.
3. **Finale:** The top 20% teams with maximum points from each zone advance to compete in the grand finale.

Problem Statement

Teams must design and build a robot capable of navigating through a maze arena and reaching the target zones within the shortest possible time.

In the Robotic Maze Solver Challenge, each team must design and operate a single manually controlled robot known as the Maze Solver. This robot will be responsible for solving the maze to reach the destination in minimum time.

Rules and Regulations

- Students from Grades 9 to 12 can participate in this competition.
- Each team can have a maximum of 3 participants.
- The Maze solver robot must be wirelessly controlled using its remote.
- Mobile phones are not allowed to control the robot.

To ensure fair play and adherence to competition standards, the Maze Solver Robot must meet the following specifications:

Control & Navigation

- The robot must be manually navigated by the operator without any autonomous features.

Motion & Mobility

- The robot must use BO DC motors with a maximum speed of 300 RPM (tested on a tachometer).
- The robot must not cause damage to the arena, props, or other objects.

Size, Weight & Electrical Constraints

- Any violation of size, or power limits may result in disqualification.
- The robot must adhere to all sizes, weight, and electrical specifications.
- The main part of the robot's dimensions must not exceed 16 cm x 16 cm x 15 cm (LxWxH) including wheels. However, the bot can extend its size once the run begins. A tolerance of $\pm 5\%$ is allowed.
- AC power supply is not allowed during the competition.
- The battery used for the robot should not exceed 12V.

Wheel Specifications and Restrictions:

- Maximum overall diameter: 8 cm and Maximum width: 4 cm.
- Omni-directional wheels are allowed.

Game-Specific Constraints

- The Maze solver Robot must start from the designated Start Zone and reach the destination by taking the best path and in less time.
- The robot must not interfere with any arena elements or props.

Guidelines

Arena

- The Arena will be disclosed on the day of Zonal itself.
- The game will take place in a 16ft × 16ft maze-style arena with wall separation 20cm.
- The Robot starts from the Start and moves on the arena to reach the End.
- There will be multiple paths to the destination complete the maze in shortest time.



Game Rules

- **Time Limit:** The entire match lasts 5 minutes.
- Team must start from the Manual Control Zone.
- Find the shortest path and complete the maze in short time.

Scoring System:

- Points are awarded based on the time taken for the completion.
- Bonus points will be awarded for completing the task before time runs out.
- Additional points can be attained by moving your robot to power markers.
- The sharing of robots between teams is strictly prohibited. Any violation will result in immediate disqualification without consent.

Evaluation Criteria

Step	Challenge	Points to Win
1	Race against Time!	• Complete the maze in < 1 minute: 5 points per seconds remaining! • Complete the maze in < 2 minutes: 3 points per seconds remaining! • Complete the maze in < 3 minutes: 2 points per seconds remaining! • Complete the maze in < 5 minutes: 1 point per seconds remaining!
2	Hit the Bonus marker!	5 Power markers will be placed in the arena each contribute 300 points.
3	Watch Out for Mistakes!	Any hit on the maze wall will result in a deduction of 5 points!
4	Special Bonus Fun!	Teams that complete all challenges without incurring any penalties will receive a special bonus of 100 points.

