Autonomous mobile Robot (AMR)

Line follower, obstacle detector, Blaze

Maze competition

*On the sidelines of the **second edition of World telecommunication day**, the Networks and Telecommunications department is organizing a **robot competition**, which will take place on May 16, 2024 at the Institute of Technolog - Ain Mlila-.*

Welcome to follow a line, Obstacle Avoiding, Blaze, Maze Challenge, where innovation meets firefighting prowess. In this competition, we aim to harness the power of autonomous firefighting robots. These robots are designed to tackle fires independently, navigating through mazes with Obstacle Avoiding; follow the lines if possible, and extinguishing flames swiftly and efficiently. The primary goal is to promote creativity and expertise in the development of autonomous firefighting technology.

1. Prizes and Awards

1st – …….. TBA
2nd –……. TBA
3rd –…….. TBA

2. Team Rules

Team members:

1. The number of teams participating in the challenge is limited to 5.
2 Maximum number of members in a team should be 3.
3. Every team must have a team leader.

Requirement:

1. Team must carry their respective laptop and required tools.

3. Autonomous Robot Specifications:

Size and Weight:

1. Robots must be built by participants

2. Robots must not exceed 20cm*20cm*20cm (L*B*H) in size to ensure compatibility with the competition arena. Approximation for error (±5%).

3. Platforms accepted (two-wheel drive max).

Sensors:

1. Robots may use flame sensors to detect fire and other sensors like line detector and obstacle detector for navigating through the arena.
2. Robot my use four ultrasonic sensors
3. Robot may use three sensors for detector line

Power Source:

1. Robots must be powered by onboard batteries.
2. The maximum battery voltage should not exceed 12V.

Programming:

1. Teams must submit their code after the round, code will be evaluated by the judges and the most efficient code will be rewarded

General:

1. The robot must be autonomous.

2. Once the competition starts, no further programming or adjustments to the robot's software will be allowed.

3. Any communication or signal interference by teams to disrupt or influence other competitors' robots is strictly prohibited.

4. Gameplay Specification:

Judge

1. The challenge is managed by a referee with two assistants

Arena Setup :

1. The competition arena consists of defined paths, multiple fire zones, detector line and obstacles to challenge the robots' abilities.

Start Zone :

1. All robots begin from a designated start zone within the maze.

Winner Determination:

1 The fastest robot Wins.

- ***The robot must go through the maze from the beginning to the exit with minimal time.***

2. Total number of points is: 200 pts.
The competition scale is as follows:

• The robot successfully reached the exit: 100 points

- Area1: 10 points
- Area2: 20 points
- Area3: 20 points
- Area4: 20 points
- Area5: 20 points
- End 10 points

• The robot successfully reached the exit at time t<=5min: +50 points

• Each Detection of fire +10 points (max five fires)

Out of Arena Handling:

1. Robots going out of bounds will be stopped and reset to the start zone.

Scoring:

1. Primary scoring is based on the time taken.

2. Secondary criteria may include innovation or efficiency in the case of a tie.

5 Disqualifications and Penalties:

Disqualifications:

1. Robots will be disqualified/penalised if they damage the arena at any point in the competition.

Penalties:

1. Each time robot clashes with an obstacle or leaves the arena it will be given a time penalty.

2. If the robot battery dies in between rounds, teams can change batteries, but they will be given a time penalty on overall time.

6. Safety :

Inspection:

1. All robots must undergo a thorough safety inspection conducted by event organizers before the competition begins.

Damage:

1. The organizer is not responsible for damage caused to vehicles during the competition.

7. Code of Conduct :

1. Participants must always display sportsmanship and respectful behaviour.

2. Unsportsmanlike conduct may result in disqualification.

8. Maze design:

Track features:

1. The width of the track is about 3 or 4 cm.

9. Conclusions:

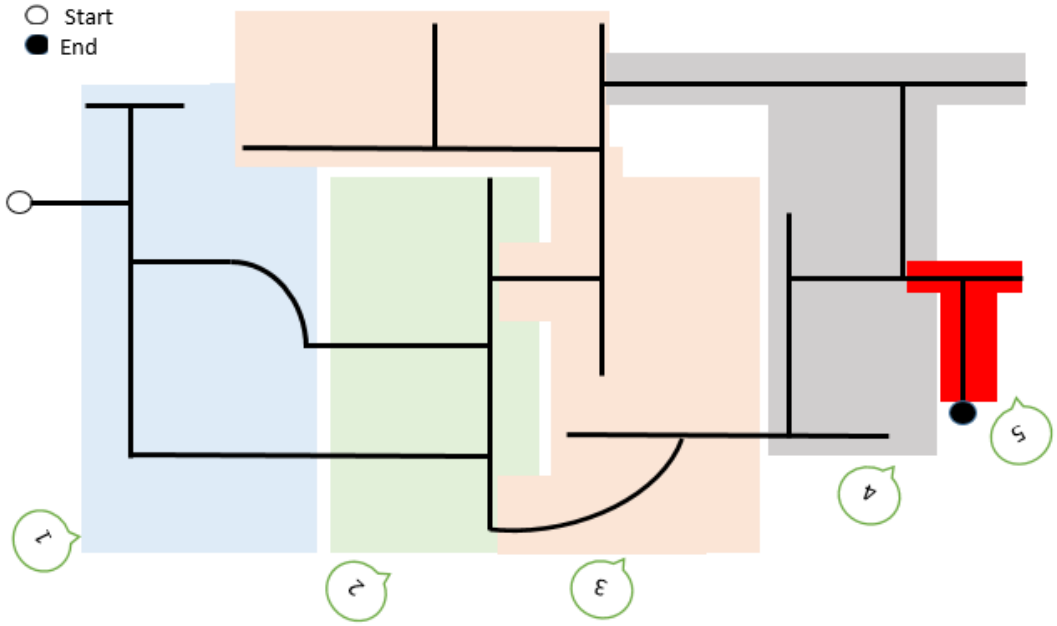
Updates and Communication:

1 Any updates, rule modifications, or clarifications will be communicated to all participating teams well in advance of the competition.

2. The organizer is allowed to change the rules before the competition.

Feedback:

1 Constructive feedback from participants will be actively sought to improve future editions of the competition.


Start
End
1
2
3
4
5