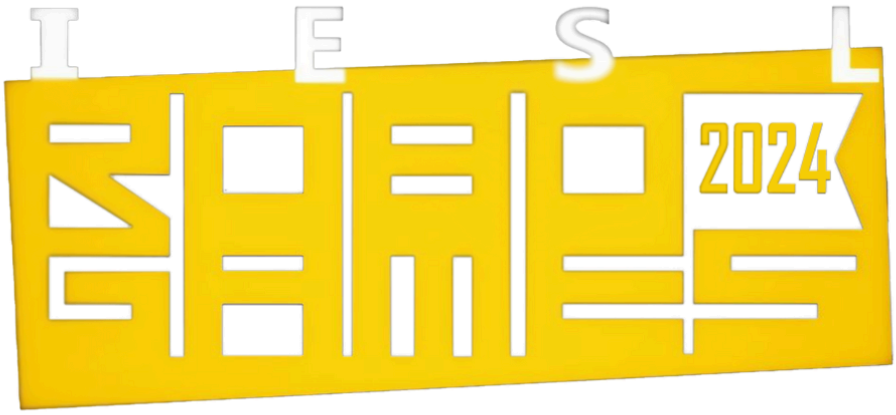

University Category Task

ELIMINATION ROUND

WELCOME TO THE ROBOGAMES 2024!

We are thrilled to announce the upcoming RoboGames competition, featuring three thrilling rounds: the Completion round,Elimination round and the Final round. Our primary objective is to foster robotics knowledge and provide an exciting platform for robot enthusiasts to showcase their skills and innovations.

In the Completion round, participants will have the chance to compete and demonstrate their capabilities using the Webots robots simulation platform. From there, all teams who complete the task successfully will advance to the second round,the Elimination round.

In the Elimination Round, participants will have the opportunity to face a challenging task, also completed using the Webot platform.

For any questions or clarifications, please contact:
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Stay tuned for further announcements and exciting developments in the world of RoboGames!

CONTENTS

GENERAL RULES

1. A team can consist of a maximum of 5 members and a minimum of 1 student. All students must be from the same school/institute.

2. A few selected teams from the elimination round will advance to the finals.

3. Plagiarism is a serious offense and will cause a team to be disqualified. The judge panel may carry out a viva if solutions provided by a team are suspected to be plagiarised.

Note: The decision of the judges will be final.

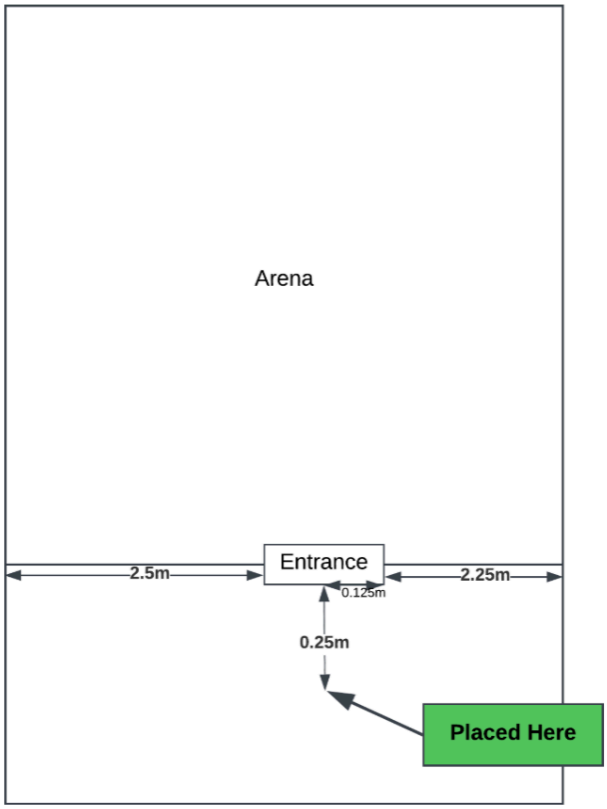
Arena Specifications

- **Wall Dimensions:** Height: 0.1m, Thickness: 0.01m, Length: Multiples of 0.25m.
- **Maze Size:** 5m × 5m.
- **Wall Spacing:** 0.25m (measured from the center axis of each wall).
- **Maze Entrance:** An entrance will be provided with a gap equal to the spacing between the walls.

Robot specifications and limits

1. Candidates must build their own robot from scratch, as the use of pre-built robots within the Webots platform is not allowed.
2. The robot:
    a. Max height: 0.25m
    b. Max width: 0.25m
    c. Max length: 0.25m

    (These dimensions serve only as upper limits, not as a required size or shape.)
3. The robot's front edge will be placed with its center aligned to the designated starting point as shown below.(Define the front edge in a screen shot)



4. The robot must not climb over the walls or use cameras to see beyond them.

Fire Pit Specifications

Fire pits are distributed throughout the maze, consisting of three danger zones:

- **Red Zone** (Center, **0.25m × 0.25m**) - **#FF0000**
    - Damage: **40**
- **Orange Zone** (Middle, **0.75m × 0.75m**) - **#FF5500**
    - Damage: **10**
- **Yellow Zone** (Outermost, **1.25m × 1.25m**) - **#FFFF7F**
    - Damage: **0**

Damage is applied **immediately upon entry** into a fire pit. While inside, damage is applied **every 2 seconds**.
If the robot is placed at two different damage zones, the highest damage will be considered.

Survivor Specifications

- **Dimensions:**
    - Height: **0.01m**
    - Base Size: **0.1m × 0.1m (square)**
- **Color: #55FF00 (Green)**
- **Reward: 20 points**
- **Placement:** Survivors will be positioned **above the ground** at the same walls.

Mission

Scenario:

The Faculty of Robo Games is in peril—it's on fire! Your objective is to rescue your coworkers by navigating through the burning maze.

Initial Conditions:

- The player starts with **100 marks**.
- The robot will be positioned at the location specified in the **Robot Specifications and Limits** section.
- A **dry run** may be performed to analyze the maze, identify fire pits, and locate survivors. However, the robot must return to the starting position afterward.
- The **time count** will begin after the dry run is completed and the actual rescue operation starts.

Objectives:

- **Rescue Survivors:** There are **3 survivors** hidden within the maze. They are denoted as **green squares.**
- The robot must traverse the maze to locate each survivor and **rescue**.
- After extracting all survivors, the robot should return to the entrance.

Rescue Procedure:

- The arena is laid out as a grid, with each cell measuring **0.25m × 0.25m**.
- A survivor occupies one of these grid squares, positioned near an edge to allow sufficient space for the robot to enter.
- To rescue a survivor, the robot must:
    1. Enter the square containing the survivor.
    2. Remain within the square for **3 consecutive seconds**.
    3. The robot must clearly demonstrate that it has entered and remained in the designated square for the required duration. Its entry and presence during the rescue must be visibly evident.

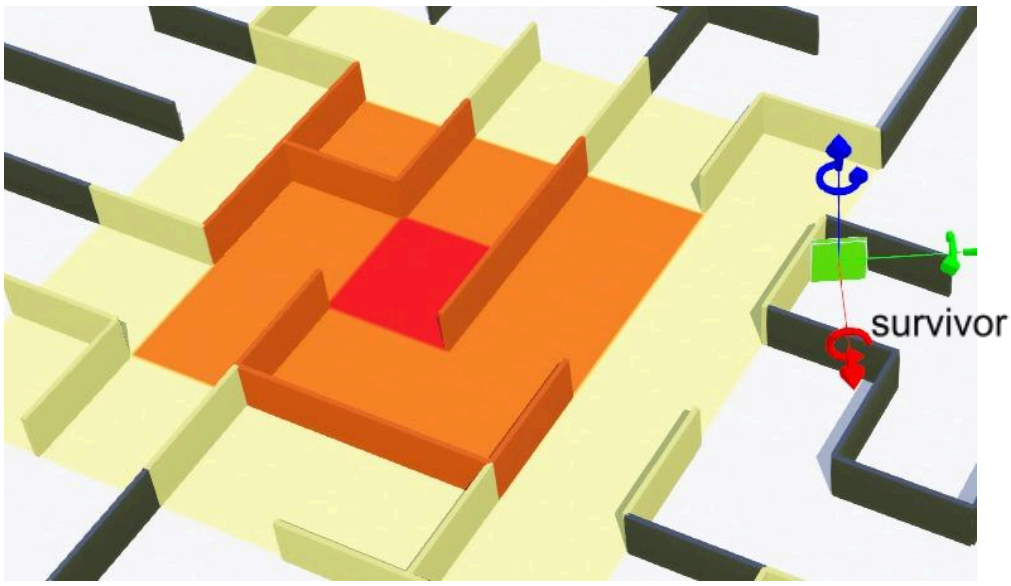
Evaluation Criteria

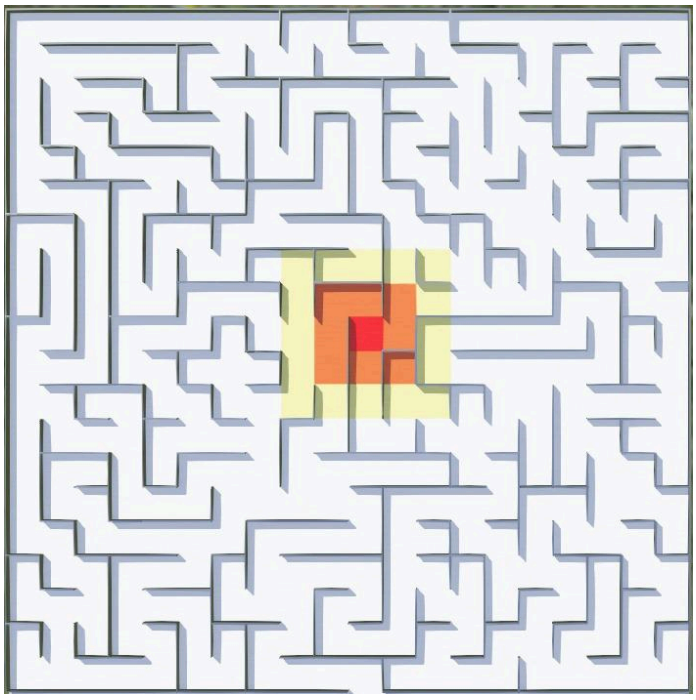
1. **Base Score:** A base score of 100 marks is awarded only if at least one survivor(+20 marks for each extraction) is rescued.
2. **Highest Marks:**
   The robots with the highest scores will be prioritized for selection.
3. **Tiebreaker (Marks Equal):**
   In the case of a tie in scores, the **time spent** from entering the maze to exiting will be considered.

4. **Additional Tiebreaker (Time Equal):**
   If the scores and times are both identical, the **competitor's code** will be reviewed for further evaluation.
5. **Penalty:** If the robot's mark reaches zero or negative, it will be disqualified.

Note: A basic wall-following approach that relies on a single wall may not be effective in this scenario. (This does not mean wall-following is entirely prohibited.)

Maze





Here is a sample image of the danger zone within the maze, where the rescuer is represented by a green square. This image serves as a reference to understand the danger zone but does not depict the entire maze. The maze contains three dead zones and three rescuers, each positioned in different areas. This image is provided for guidance only and should not be considered a complete representation of the maze.

Video Submission Requirements

- Include a camera feed in the recording.
- Show the complete task execution from start to finish.

Note: The robot should stop after completing the full task

VIOLATIONS

1. Modifications of changing the initial position, exceeding the given size of the robot and changing the direction of the robot.

2. Manipulating/editing the video demonstration intended to mislead the judges is a violation. The code you submit will be executed and checked against the video submission and any discrepancy will be investigated.

Any violation will cause the submission to be rejected

SUBMISSION

1. The submission period **starts at 12:01 pm on the 6th of February** and **ends at 11:59 pm on the 14th of February 2025.**

2. Participants will receive the submission link via email, and it will also be shared in the WhatsApp group.

3. A submission should include the following contents :

    I. The entire project (A zip file of the project)
    II. A video demonstrating the robot performing the task.