MoonRover Robotics Competition

Challenge:

In this lunar surface navigation challenge, the goal is to guide a robot from its starting point, known as Shiv Shakti, to the destination marked in the provided mat pdf, while adhering to certain constraints and time limits. The objective is to complete this challenge in the shortest time possible, with a maximum time allowance of 90 seconds.
The robot's performance will be assessed based on its accuracy in following the designated track. To score well, the robot must:

- Precisely follow the designated path as depicted on the mat.
- Successfully navigate obstacles without making contact with them.
- Ensure that no part of the robot crosses the craters or comes into contact with the edges of the course.
- Ensure that a maximum 4 sensors are used in the robot
- Robot should start from the “SHIVSHAKTI” position and stop at the “STOP” position.
- For every obstacle and crater sensing, the robot will get 5 points.
- If a robot's wheel touches a crater or obstacle, 5 points will get deducted from your actual score. If the final score is negative then it will be assumed as zero.
- If the robot reaches the STOP position from the START without sensing the obstacle or crater, the robot will get 5 points for completing the path.
- If a robot touches the mat boundary then the robot has to stop manually and again you have to place the robot at “START” position.In this case your previously scored points will vanish.
- The robot is designed to detect and avoid obstacles and craters and intelligently navigate its path

The challenge demands both speed and precision and the aim is to complete the track with the highest degree of accuracy and within the specified time limit.

Objective:

- Teach students to create robots for exploring a landscape quickly.
- Help students build their own robot designs for lunar like terrain surface adventures
- Encourage students to use what they know about machines and electronics to demonstrate a well-made robot (that could be your own CuroBot purchased from Curiosity Gym)

Arena Information:

1. The arena should be set up on any flat surface, and covering it with white flex is optional. The surface should have a plain, high-contrast colour compared to the black line circumference (black electric tape).
2. The mat's dimensions are 94 cm diameter.All crater and obstacle coordinates measurements mentioned in mat are in cm.
3. The field design should be the same as the mat shown in the provided challenge mat.
4. The starting point and ending point must be clearly marked.
5. To create a track you must use Black glossy electrical insulation tape 1.5 inches thick You can buy this online here or from any other source.
6. Please stick the Black tape on the surface directly.
7. Obstacles and craters should be placed according to the image.
8. Obstacles can be created using medium-sized cardboard or objects of similar height.
9. The obstacle height is 7 x 7 cm.
10. Craters should be constructed from black paper and cut as per the given dimensions.

11. The crater diameters should be 12 cm (Bigger one) and 7 cm (for all smaller ones) respectively.

The Robot Criteria (For Option1 Participants)

- The robot must compete in the unwired category only. The robot cannot use any wired external power source during the challenge.
- The robot's maximum dimensions should not exceed 15 cm in width and 25 cm in length, with a maximum weight of 1 kg.
- The robot's power source must operate at or below 9V.
- Ready-made robots and Lego parts are not allowed for use in this challenge.
- Mechanisms on the robot that can potentially damage the arena or itself are prohibited.
- A maximum of four sensors can be employed, with extra points awarded if the robot uses fewer than four sensors.
- Avoid incorporating sharp edges in the robot's design.

Eligibility Criteria: Age 13+

Competition Rules:

1. Only individual entries are allowed, no team submissions are allowed
2. Place obstacles and craters at mentioned coordinates.
3. The robot can freely move around the entire arena
4. The robot must avoid obstacles and craters while completing the course as quickly as possible.
5. The robot must complete the course within a maximum time limit of 90 seconds; entries exceeding this time will be rejected
6. Participants must upload screenshots of their code with comments as an attached pdf on MySphere and information about the IDE used for code development.
7. Provide detailed technical specifications for the robot and sensors used in the competition
8. Decisions of the judges are final and binding. In the event there are not enough eligible entries, not all prizes will be awarded

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Submission Details

To enter the competition, please follow these steps:

1. **Registration:**

   a. Visit mysphere.net/register.

   b. Sign up on the platform by providing your basic information and setting a password. ***Be sure to include the referral code 'CGMRSUB' in the designated referral code field. This is a must.***

   c. Once you've created your account, you will receive an email for verification. Please check your email for a verification message from MySphere.net.

   d. After verifying your email, log in again to the MySphere platform.

   e. Upon logging in, you will be prompted to verify your mobile number. Kindly follow the OTP (One-Time Password) process for mobile verification.

   f. You may also be asked to add your interests. Once completed, click on the ***"Go to MySphere"*** button.

2. **Project Submission on MySphere:**

   a. In the top right corner of the screen, click the dropdown arrow next to your name and select ***"Portfolio."***

   b. Click on ***"Create Project."***

   c. Upload a cover photo for your project.

   d. Provide project details, which include - the Project ***Title***, a ***Description*** in your own words, the project's ***Objectives***, and any ***Key learnings***. All these fields are mandatory & must be filled in for a complete submission to the competition.

   e. ***Upload a Full video*** demonstrating your robot's lunar surface navigation from the starting point to the finish point. This is mandatory for the project submission.

   f. ***Upload a PDF or document*** containing the ***code*** used for the robot. This is mandatory for the project submission. This is crucial for the assessment.

   g. Ensure that the project settings are set to **"Public."** The default setting is "Connection."

   h. Click **"Save."**

   i. After saving your project, please double-check to ensure that it is displayed.

   If you have any doubts on the process described above, write to explore@curiositygym.com

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Judging and Scoring Criteria

Judging, carried out by the Curiosity Gym team, will be based on the following scoring criteria:

1. Eligibility: Entries must meet submission and registration criteria.
2. Evaluation: Assessment will consider the criteria outlined below.

Criteria	Points Awarded
Clarity of Video Uploaded to MySphere	5
Construction of the Mat	5
Minimum Time Taken with (minimum two Craters and one obstacle sensed)	20
Code with Comments	10
Use of Fewer than 4 Sensors	10
Points on Mat Navigation	
- Avoiding Obstacle (each) (Max. 2)	10 (5x2)
- Avoiding Crater (each) (Max. 7)	35(7x5)
For path completion START to STOP	5
Total Possible Score	100

[Note:- If the Robot's wheels or sensors touch a crater or obstacle then 5 points will get deducted from your total points scored.]

Award Criteria:

1st Prize: ₹15,000/- Amazon Voucher
2nd Prize: ₹10,000/- Amazon Voucher
3rd Prize: ₹5,000/- Amazon Voucher

These prizes will be awarded to individual participants based on their performance in the competition. In the event there are not enough eligible entries, not all prizes will be awarded

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Competition Mat:-
The numbers below indicate the x,y coordinates of the craters.