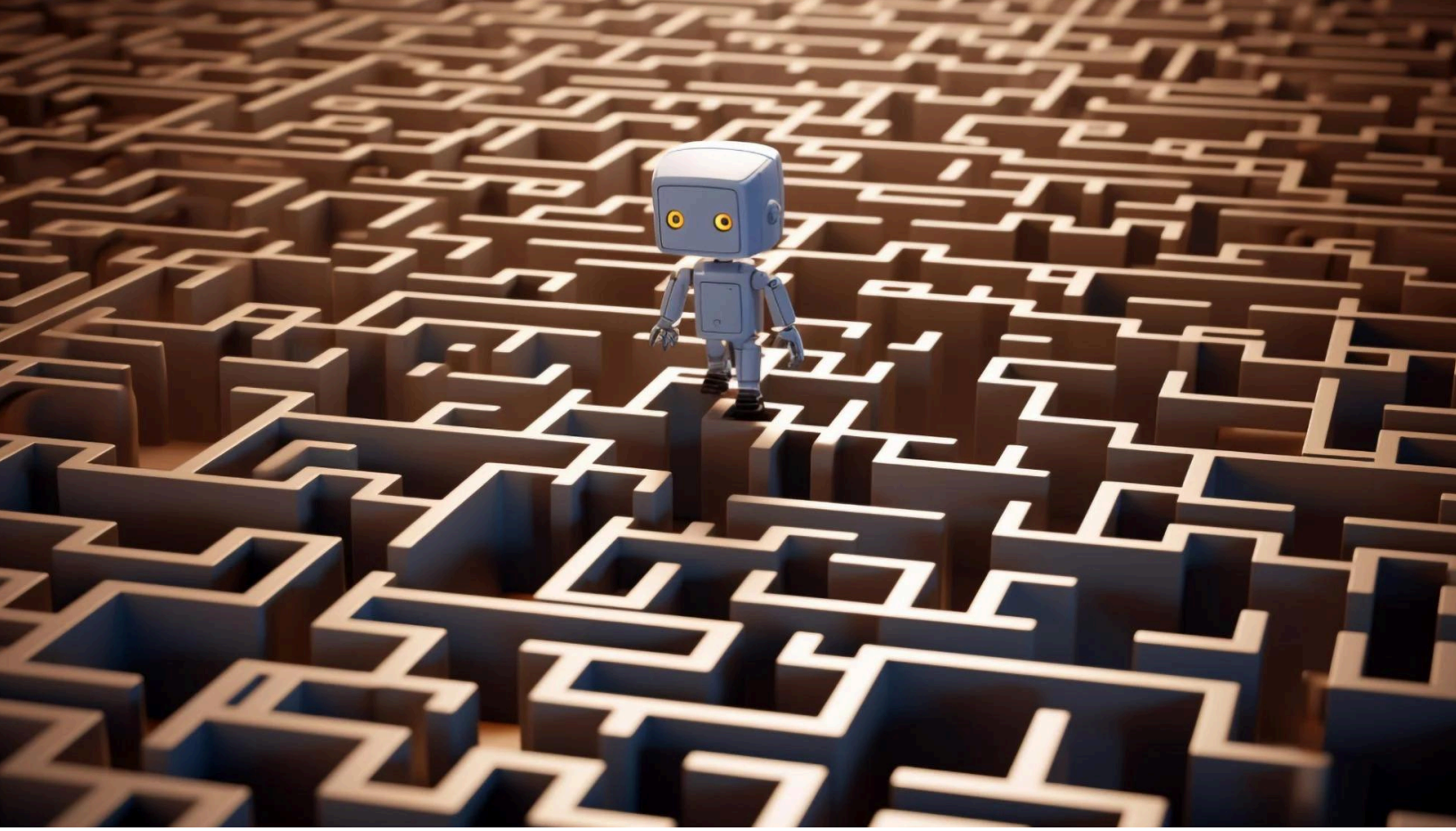

NANONAVIGATOR

INTRODUCTION

The International NanoNavigator Competition is a global showcase of autonomous robotics brilliance. Participants design small, self-contained robots, or "micro mice," equipped with sensors and algorithms to navigate intricate mazes autonomously. From students to seasoned enthusiasts, competitors strive for speed and precision as their micro mice tackle challenging maze layouts. Categories like "Classic" and "Micro" add diverse challenges to the competition. This event not only highlights the excitement of

robotic ingenuity but also fosters collaboration and knowledge exchange among participants.

Join us in witnessing the tiny marvels of the International NanoNavigator Competition, where innovation in autonomous robotics takes center stage.

PROBLEM STATEMENT

Design and build a micro-mouse robot capable of navigating a complex maze in the shortest time possible while minimizing wall hits.

ROUND 1

It will be a qualification round for the final.

- Each team must present their robot using a PowerPoint presentation (PPT) in under 3 minutes.
- Exceeding the time limit will result in penalty points or disqualification.

CONTENT REQUIREMENTS FOR PPT

Specifications, control systems and dimensions of robot.

Final decision will be in the hands of judges which will be non questionable.

NOTE: 2. No hardware alterations can be made in the bot after it's presentation in round 1

(Bots will be re-checked on next day for such alterations, non compliance will result in disqualification)

ROUND 2

The maze for round 2 will be revealed at the time of the competition.

MAZE SPECIFICATIONS

- The maze will be composed of a grid of 64 square cells (8*8 cells maze) of dimensions 0.16 x 0.16m each cell.
- The walls constituting the maze shall be minimum 0.08m high and 0.01m thick
- Passageways between the walls shall be minimum 0.16m wide.
- The outside wall shall enclose the entire maze.
- The sides of the maze walls are white.
- The top of the wall is red.

- The floor of the maze is black.
- A visual representation of the maze will be provided to participants.

MICROMOUSE SPECIFICATIONS

- Micromice must be free-standing and self-contained. Energy sources using combustion are not permitted.
- A micro mouse must not leave any part of itself in the maze.
- A micro mouse must not jump over or climb the maze walls, or use any sensing method likely to cause damage to the maze.
- Participants have complete freedom in choosing the wall-sensing technique.
- The height of the bot should be kept within 8cm, with a tolerance of 3cm.
- All the wall sensing devices (camera, IR sensors, Ultrasonic sensors, etc...) or any other such medium to detect the walls and their position cannot be placed on a bot at a height greater than that of walls.
- The final decision to allow a robot on track will be in the hands of organizers and judges.

COMPETITION RULES

- The operator shall not touch the running micro mouse unless instructed or authorized to do so by the judges.
- The competition judge will permit a manual recovery if the micro mouse has malfunctioned or is unable to continue running. In addition, a request for recovery under any other circumstances may be accepted on the condition that all memories concerning the maze be erased.
- Each team will be given only a maximum of 15 minutes for their showdown.
- A Report to be submitted before the start of cognizance, containing a timeline, design of the robot, and expected functions.

JUDGING

Primary:

Time taken to complete the maze (fastest time wins).

Number of wall hits during navigation (least wall hits wins).

Secondary:

Creativity and innovativeness of the robot design.

Team presentation and documentation.

DELIVERABLES

- A fully functional micro-mouse robot.
- A technical report detailing the robot's design, construction, and programming.

ADDITIONAL NOTES

- The use of Gazebo and ROS is encouraged, but not mandatory for participation.
- Safety is paramount. Robots must be designed and operated safely.
- Sportsmanship and ethical conduct are expected of all participants.

We are excited to see your creative solutions and look forward to a thrilling competition!

Rules for Abstract Submission

- The cover page of the submission should include the following details of all team members along with the Team Name:

Name: **City :**

Branch: **E-mail:**

Institute Name: **Contact No. :**

- The file should be in PDF format only and the filename should be according to the following convention:

  ABSTRACT_<EVENT_NAME>_<COGNI_ID>.PDF

  (eg ABSTRACT_NANONAVIGATOR_COG190023.PDF)

- The confirmation of acceptance of the submission will be sent via email to the participant.

FINAL EVALUATION

The overall score will be calculated by compiling the scores obtained in the two rounds, based upon which winners will be declared.

GUIDELINES

- **Eligibility:** Students pursuing Undergraduate Degrees/ Master's Degrees in any discipline.
- **Team Size:** A team can have a minimum of 3 and a maximum of 5 members.
- **No Double Troubles:** Only one entry would be acceptable. In case of multiple entries, the latest one would be considered for evaluation.

- **Zero Plagiarism:** The documents would be tested via special software for plagiarism. If some duplication is found, the entire work will be rejected from the competition.

REGISTRATION PROCEDURE

- The registration shall be done through the Cognizance website.
- Each Member needs to register on the website. This will generate a unique Cognizance Id, after email verification.
- The Team Leader (which you will select yourself) must log into the website with his username and password.
- After logging in to his Cogni ID, the team leader needs to select Nanonavigator from the dashboard to participate in this particular event.
- The Team Details include the following details of all team members:

Name: **City:**

Branch: **E-mail:**

Institute Name: **Contact No.:**

- Enter the Cognizance ID of the team leader and other team members.

QUERIES

For any queries, you can contact:

AARUSH MANGLECHA | +91 74108 87910

JAYPAL KUSHWAHA | +91 78884 33760

OR

Just mail us with the Subject: **“Query | EVENT NAME | Cogni ID | TeamName”** at submission.cognizance@iitr.ac.in