

Maze Solver 2.0

April 6, 2019



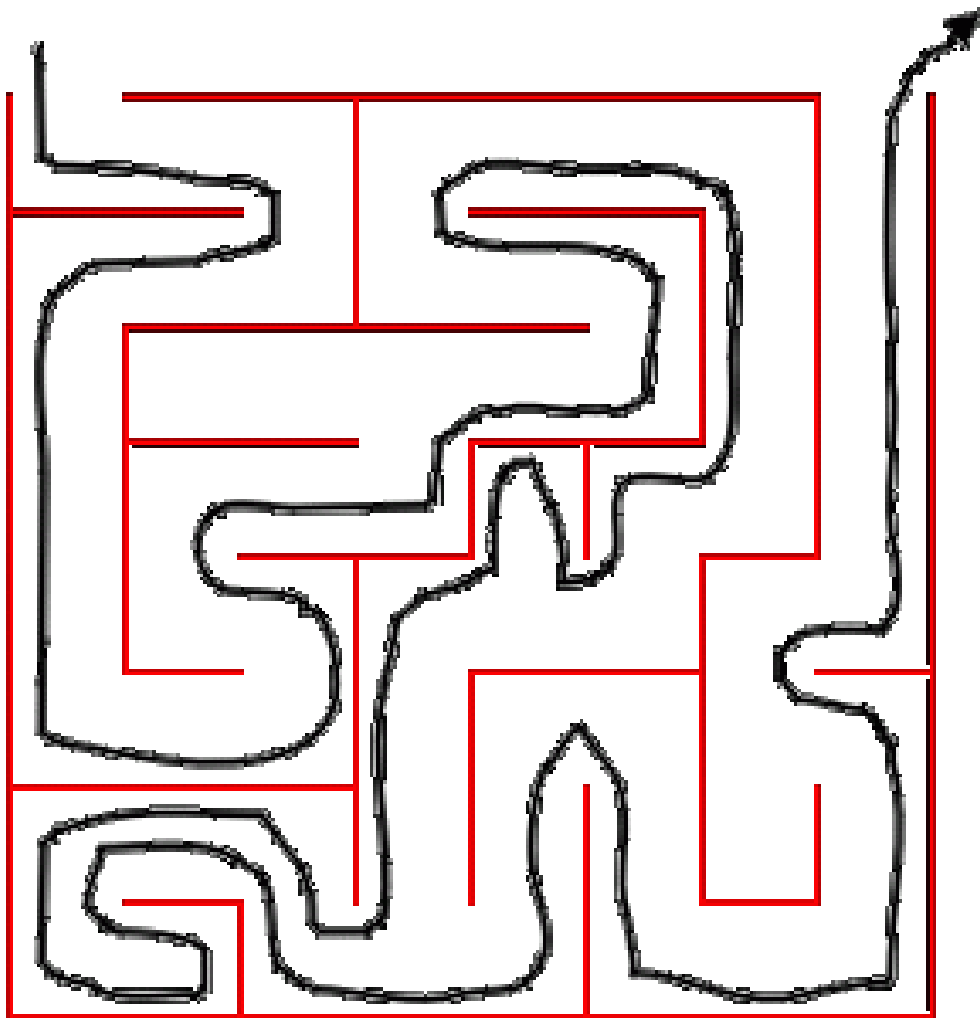
Convened by

IEEE Student Branch

Quantum University, Roorkee

Uttarakhand, India – 247167

Maze Solver



About Event:

Robotics is an interdisciplinary field involving the mechanical, electrical, electronic and computer science disciplines. As we all know that machines that can replace human beings as regards to physical work and decision making are categorized as robots and their study as robotics.

Maze Solver is an Artificial Intelligence based competition in which participants has made a simple bot equipped with surface sensing sensor, which will help the bot to find the path and solve the MAZE. The team whose bot will solve the maze efficiently and in lesser time will win.

IEEE student branch at Quantum University, Roorkee invites students and research scholars from various engineering fields to showcase their skills acquired in the interdisciplinary domain of robotics in order to compete in a healthy environment using bots to win.

Registration Process:

1. The teams are required to register by filling the registration form available on the event website <http://sites.ieee.org/sb-qst/>.
2. A team can have maximum 4 students.
3. After filling the registration form, the participants are required to pay the registration fee as mentioned below latest by March 31, 2019.
4. The duly filled registration form and a copy of fee receipt should be submitted to the event team latest by April 2, 2019 through mail at ieee.qst@quantumeducation.in or post at the institute address.

Registration Fees:

Category	Registration Fees
Research Scholars / Students (Non – IEEE Member)	500 INR / Team
Research Scholars / Students (IEEE Member)	400 INR / Team

The registration fee can be paid by demand draft in favor of **Quantum School of Technology**, payable at **Chhutmalpur**, through NEFT/RTGS or at the Account office of the institute in cash. The details of bank account for NEFT / RTGS are as given below;

Account Name: Quantum School of Technology

Bank Name: Bank of Baroda

A/c Number: 38010200000001

Address: CHHUTMALPUR

IFSC Code- BARB0CHHUTM (Fifth Letter from Left is Zero)

Rules of the Event:

Rules for Bot

1. A BOT shall be self-contained (no remote controls). A BOT shall not use an energy source employing a combustion process.
2. A BOT shall not leave any part of its body behind while negotiating the maze.

3. A BOT shall not jump over, fly over, climb, scratch, cut, burn, mark, damage, or destroy the walls of the maze.
4. A BOT shall not be larger either in length or in width, than 20 centimeters. The dimensions of a BOT that changes its geometry during a run shall not be greater than 20 cm x 20 cm.
5. Any violation of these rules will constitute immediate disqualification from the contest and ineligibility for the associated prizes.

Rules for Maze

1. The maze is composed of multiples of an 27 cm x 27 cm unit square. The walls of the maze are 10 cm high and 1cm thick (assume 5% tolerance for mazes). Thus, the internal navigable area within a square is 25cm, not 27 cm. The maze comprises up to 25 x 25-unit squares.
2. The sides of the maze walls are white and the floor is black. The maze is made of wood, finished with non-gloss paint.

WARNING: Do not assume the walls are consistently white, or that the floor is consistently black. Fading may occur; parts from different mazes may be used. Do not assume the floor provides a given amount of friction. It is simply painted plywood and may be quite slick. There may be a seam between the two sheets on which any low-hanging parts of a robot may snag.

3. The start of the maze is located at one of the four corners. The start square is bounded on three sides by walls. The start line is located between the first and its second squares. That is, as the robot exits the corner square, the time starts. The destination goal is the four cells at the center of the maze. The destination square has only one entrance.
4. Small square zones (posts), each 1 cm x 1 cm, at the four corners of each unit square are called lattice points. The maze is so constituted that there is at least one wall at each lattice point.
5. Multiple paths to the destination square are allowed and are to be expected. The destination square will be positioned so that a wall-hugging robot will NOT be able to find it.

Rules for Contest

1. Each contesting BOT is not allocated any time to access the maze prior to their first run. Contestants have 10 minutes total to complete as many runs as they wish. Any time used to adjust a robot between runs is included in the 10 minutes. Each run (from the start cell to the center zone) in which a robot successfully reaches the destination square is given a run time. The minimum run time shall be the robot's official time. First prize goes to the robot with the shortest official time. Second prize to the next shortest.
2. The initial run shall be made from a random one of the four possible starting squares. Following runs within the 10 minutes allowed shall all be from the same starting square as the first run. The operator may abort a run at any time. If an operator touches the BOT during a run, it is deemed aborted, and the robot must be removed from the maze. If a robot has already crossed the finish line, it may be removed at any time without affecting the run time of that run. If a robot is placed back in the maze for another run, a one-time penalty of 30 seconds will be added to the robot's best time.
3. After the maze is disclosed, the operator shall not feed information on the maze into the BOT however, switch positions may be changed for the purpose of changing programs

within the robot (changing algorithms is allowed. Entering info on the maze is not allowed and does not constitute "changing algorithms.).

4. The illumination, temperature, and humidity of the room shall be those of an ambient environment. (40 to 120 degrees F, 0% to 95% humidity, non-condensing).

BEWARE: Do not make any assumptions about the amount of sunlight, incandescent light, or fluorescent light that may be present at the contest site.

5. The run timer will start when front edge of the robot crosses the start line and stops when the front edge of the robot crosses the finish line. The start line is at the boundary between the starting unit square and the next unit square clockwise. The finish line is at the entrance to the destination square.
6. Every time the robot leaves the start square, a new run begins. If the robot has not entered the destination square, the previous run is aborted. For example, if a robot re-enters the start square (before entering the destination square) on a run, that run is aborted, and a new run will be deemed begun, with a new time that starts when the starting square is exited.
7. The robot may, after reaching the destination square, continue to navigate the maze, for as long as their total maze time allows.
8. If a robot continues to navigate the maze after reaching the destination square, the time taken will not count toward any run. Of course, the 10-minute timer continues to run. When the robot next leaves the start square, a new run will start. Thus, a robot may and should make several runs without being touched by the operator. It should make its own way back to the beginning to do so.
9. The judges reserve the right to ask the operator for an explanation of the BOT. The judges also reserve the right to stop a run, declare disqualification, or give instructions as appropriate (e.g., if the structure of the maze is jeopardized by continuing operation of the robot).
10. A contestant may not feed information on the maze to the BOT. Therefore, changing ROMs or downloading programs is NOT allowed once the maze is revealed. However, contestants are allowed to:
 - a) Change switch settings (e.g. to change algorithms (for example from left-turning to right turning - again, entering data on maze size or content is NOT inclusive of this rule.)
 - b) Replace batteries between runs
 - c) Adjust sensors
 - d) Change speed settings
 - e) Make repairs
11. However, a contestant may not alter a robot in a manner that alters its weight (e.g. removal of a bulky sensor array or switching to lighter batteries to get better speed after mapping the maze is not allowed). The judges shall arbitrate.
12. All robots, whether or not they have competed in previous contests, compete on an equal basis. All robots must be presented to the judges by the original design team, which must meet all other qualifications. First prize will go to that robot which travels from the start square to the destination square in the least amount of time. Second prize will be awarded to the second fastest.

The decision of judges regarding winner and runner up in maze solver would be final and binding.

Prizes:

The winner team would be awarded with a certificate to each member, memento and cash prize of INR 5,000 only.

The runner up team would be awarded with a certificate to each member, memento and cash prize of INR 3,000 only.

Each participant would get a certificate of participation.

Executive Committee:

Mentor

Dr. Gulshan Chauhan, Dean, Faculty of Technology, Quantum University, Roorkee

Convener

Mrs. Jaspreet Shrivastava, Branch Counselor, IEEE Student Branch

Co-convener

Mr. Raunak Gupta, Chapter Advisor (RAS), IEEE Student Branch

Student Team

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