

ROBOTICS AND ARTIFICIAL INTELLIGENCE FOUNDATION (RAAIF)

AGRIBOT – PROBLEM STATEMENT

Introduction

“Every turn, every sensor reading, brings the robot closer to its goal, one step at a time”



Objective:

In this competition, the mission of the Micro robot is to navigate a maze from specified corner to its centre and move out on opposite direction in the shortest possible time.

Rules for the Micro robot:

1. The Micro robot should be autonomous (no remote controls).
2. The Micro robot shall not leave any part of its body behind while navigating the maze.
3. The Micro robot shall not jump over, fly over, climb, scratch, cut, burn, mark, damage, or destroy the walls of the maze.
4. The Micro robot shall not be larger, either in length or in width, than 16 Centimeters. The dimensions of a Micro robot that changes its geometry during a run shall not be greater than 16×16cm. There are no restrictions on the height of a Micro robot.
5. Any violation of these rules will constitute immediate disqualification.

Rules for the maze:

1. The maze is composed of 18×18 cm unit squares and comprises up to 16×16 unit squares. The walls of the maze are 3cm high and 1.2cm thick (assume 5% tolerance for mazes) Thus, the distance from wall to wall within a square is 18cm. The outside wall encloses the entire maze.
2. The sides of the maze walls are white, the tops of the walls are red, and the floor is black, finished with matt color.
3. Warning: Do not assume the walls are consistently white, or that the tops of the Walls are consistently red, 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.
4. 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 second squares. The destination goal is the four 18×18 cm cells at the centre of the maze. The finish line is at the entrance to the destination square.
5. Multiple paths to the destination square are allowed and are to be expected. The destination square has only one entrance and it will be positioned so that a wall hugging robot will not be able to find it.

Rules for the competition

1. Each contesting Micro robot is allocated a total of 5 minutes of access to the final maze. Any time used to adjust a robot between runs is included in these 5 minutes.
2. Each run (from the start cell to the centre 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, and so on. Robots that do not enter the centre square will be ranked low and may be selected by how close they got to the destination square.
3. Each run shall be made from the starting square. The operator may abort a run at any time. If an operator touches the Micro robot during a run, it is deemed aborted, and the robot must be removed from the maze.
4. If a robot has already crossed the finish line, it may be removed at any time without affecting the run time of that run.
5. After the maze is disclosed, the operator shall not feed information of the maze into the Micro robot.

The contestants are allowed to:

- Change the positions;
- Adjust sensors;
- Make repairs in case the Micro robot breaks down.
- The run timer will start when front edge of the robot crosses the start line and stops when the rear edge of the robot crosses the finish line.
- It must be possible to add color with a marker / sticker on top of the robot.

Organization

1. The robot must be registered before the competition. The registration process includes technical inspection of the robot and marking the robot with a number sticker.
2. Technical inspection must be completed by the time that is specified by the organizers.
3. All questions and problems arising during the competition are addressed by the referee.
4. The final decision regarding any appeals is made by the referee and / or the organizers. All complaints must be reported to the referee during the match or right after the ending of the match. Complaints filed later will not be accepted. The final decision regarding any disputes or inconsistencies is always made by the referee.

Changes and cancellations in the rules:

1. Changes and cancellations made to the rules are adopted by the main organizer of the Competition, according to the regulations of the regulatory committee of the competition.
2. This challenge again introduced after 2014 by RAAIF, next version will be using AI fully please do explore and enjoy. Comments about the improvement are highly appreciated.