

## REGULATIONS «MAZE SOLVING»

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## **1 Introduction**

The Maze Solving challenge was adopted from the “Official Rules for North American Micromouse Contests” and its regulations have been adopted within the framework of the NPO ROBOTEX so that it corresponds to modern technological developments.

## **2 Objective**

In this challenge, the mission of the autonomous robot is to drive through a maze from specified corner to its centre in the shortest possible time.

## **3 Eligibility of Participation**

1. The competition accepts participation of teams and not individuals.
2. The team consists of 2-5 persons.

## **4 The Robot**

1. The robot shall be self-contained (no remote controls).
2. The robot shall not leave any part of its body behind while negotiating the maze.
3. The robot shall not jump over, fly over, climb, scratch, cut, burn, mark, damage, or destroy the walls of the maze.
4. The robot shall not be larger, either in length or in width, than 16 centimetres. The dimensions of a robot that changes its geometry during a run shall not be greater than 16 cm x 16 cm. There are no restrictions on the height of the robot.
5. The body of the robot must entirely block time measuring system light beam with a diameter of 3 mm at the height of 3 cm.
6. Any violation of the above rules will constitute immediate disqualification of the robot.

## **5 The Maze**

1. The maze of the competition remains secret until the competition day. Participants are expected to take into consideration the details below and develop a generic code that can perform successfully on any maze.
2. The maze is composed of 18 cm x 18 cm unit squares and comprises up to 16 x 16 unit squares. The walls of the maze are 5 cm high and 1.2 cm thick (assume 5 % tolerance for mazes). Thus, the distance from wall to wall within a square is 16.8 cm. The outside wall encloses the entire maze.
3. The sides of the maze walls are white, the tops of the walls are red, and the floor is black, finished with matt colour.
4. 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.

5. 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 cm x 18 cm cells at the centre of the maze. The finish line is at the entrance to the destination square.
6. 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 mouse will not be able to find it.

## **6 The Competition**

1. Each contesting 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 the 5 minutes. 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 by the maximum number of cells they consecutively transverse without being touched.
2. Each run shall be made from the starting square. The operator may abort a run at any time. If an operator touches the robot 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.
3. After the maze is disclosed, the operator shall not feed information on the maze into the robot.
4. The contestant is allowed to:
  - change switch positions;
  - adjust sensors;
  - make repairs in case the robot breaks down.
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.

6. The competition is organized for the **LEGO® MINDSTORMS**, **ARDUINO®**, **EDISON®** and **ENGINO®** platforms for the categories and levels indicated in the table below:

**Table 1: Categories & Levels for MAZE SOLVING**

| Category →   |         | Primary                           | Primary                           | Gymnasium                         | Lyceum                            | University         | Special Category          |
|--|---------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------|---------------------------|
| Challenges ↓   | Level → | 1 <sup>st</sup> – 3 <sup>rd</sup> | 4 <sup>th</sup> – 6 <sup>th</sup> | 1 <sup>st</sup> – 3 <sup>rd</sup> | 4 <sup>th</sup> – 7 <sup>th</sup> | All Years of Study | Soldiers, Adults & Others |
| Maze Solving ( <b>ARDUINO®</b> , <b>EDISON®</b> & <b>ENGINO®</b> ) |         | X                                 | X                                 | √                                 | √                                 | √                  | √                         |
| LEGO® Maze Solving   |         | X                                 | √                                 | √                                 | √                                 | X                  | X                         |

## 7 Terms and Conditions of Participation

1. Participation in ROBOTEX CYPRUS assumes and requires acceptance of all terms and conditions for participation by competitors, the coaches and the organizations they represent.
2. In case of any difference in the competition rules between the English and the Greek versions, the English version is considered as correct.
3. The robot must be registered before the competition. The registration process includes technical inspection of the robot, marking the robot with a number sticker, and the order in which it will compete which is generated by an algorithm in the information system supporting the ROBOTEX CYPRUS organization.
4. All questions and issues that may arise during the competitions must be reported to the judges.
5. The final decision about objections will be taken by the judges in cooperation with the organizers.
6. Judges' decisions on any objections are considered final and can not be challenged by participants, the coaches or the organizations they represent.

## **8 Robot Technical Control**

1. The robots' technical control will take place on the day of the competition at an area and on time specified by the organizers.
2. Failure of a team to come in time for a robot's technical check leads to the team being excluded from the event.
3. The leader of the team only is responsible to take the team's robot for technical control.
4. Technical control takes place before each phase of the competition (preliminary, qualifying, final) in which the team may participate.
5. Technical control includes the control of the robot based on the above and the paragraph "The Robot", if this paragraph exists. If the robot does not meet the requirements it will not be accepted to compete and will automatically be disqualified from the event.

## **9 Changes and Cancellation of Rules**

Any changes and/or cancellations in the rules of the competition are decided by the Cyprus Computer Society in consultation with the Organizing Committee of the CYPRUS ROBOTEX CHALLENGE. You may address comments and suggestions to the Organizers at [robotex@ccs.org.cy](mailto:robotex@ccs.org.cy) .

