IEEE-RHU MicroMouse

2024 – 2025
Elementary Competition Rules

The following rules will be observed for the IEEE-RHU Micromouse annual competition held at RHU. These rules are adapted from the 1986 official rules for North America Micromouse Contests

A. Objective

Contestants registered in the IEEE-RHU MicroMouse competition should design and build a robotic "mouse" which will navigate a predefined maze of standard dimensions from a specified corner to its center in the shortest time possible.

B. Contest Eligibility

1. All contestants must be below than 15 years of age and preferably benefiting from an IEEE membership at the time of entry in the Micromouse contest.

2. The contestant(s) will make a brief presentation of their mouse design prior to the competition (5 - 15 minutes max).

3. The Micromouse entry may be the effort of an individual or a team. In the case of a team it should be possible to demonstrate that each individual made a significant contribution.

4. A team may consist of up to four members and a coach.

5. All entrants to the contest must declare their intention to enter the contest by no more than April 25, 2024.

6. Two or more mice of near identical design from the same school are not allowed.

C. Rules for the Micromouse

1. A Micromouse shall be self-contained (no remote controls). A Micromouse shall not use an energy source employing a combustion process.

2. A Micromouse shall not leave any part of its body behind while negotiating the maze.

3. A Micromouse shall not jump over, fly over, climb, scratch, cut, burn, mark, damage, or destroy the walls of the maze.

4. A Micromouse shall not be larger either in length or in width, than 25 centimeters. The dimensions of a Micromouse that changes its geometry during a run shall not be greater than 25 cm x 25 cm. There are no restrictions on the height of a Micromouse.

5. Any violation of these rules will constitute immediate disqualification.
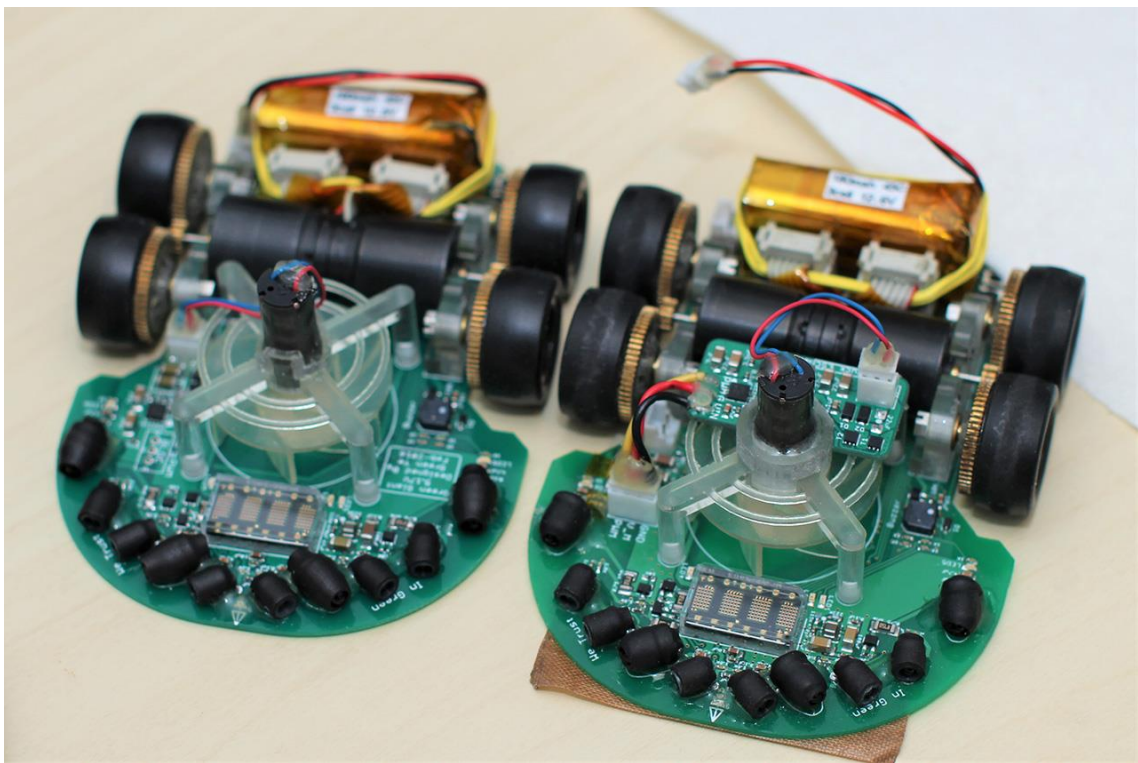
D. Rules for the Maze

1. The maze is composed of multiples of an 18 cm x 18 cm unit square. The maze comprises 16 x 16 unit squares. The walls of the maze are 5 cm high and 1.2 cm thick (assume 5% tolerance for mazes). 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. The maze is made of wood, finished with non-gloss paint.

   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. It is simply painted plywood and may be quite slick. The maze floor may be constructed using multiple sheets of plywood. Therefore, there may be a seam between the two sheets on which any low-hanging parts of a mouse 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 second squares. That is, as the mouse exits the corner square, the time starts. The destination goal is the four cells at the center of the maze. At the center of this zone is a post, 20 cm high and each side 2.5 cm. (This post may be removed if requested.) The destination square has only one entrance.

4. Small square zones (posts), each 1.2 cm x 1.2 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 mouse will NOT be able to find it.
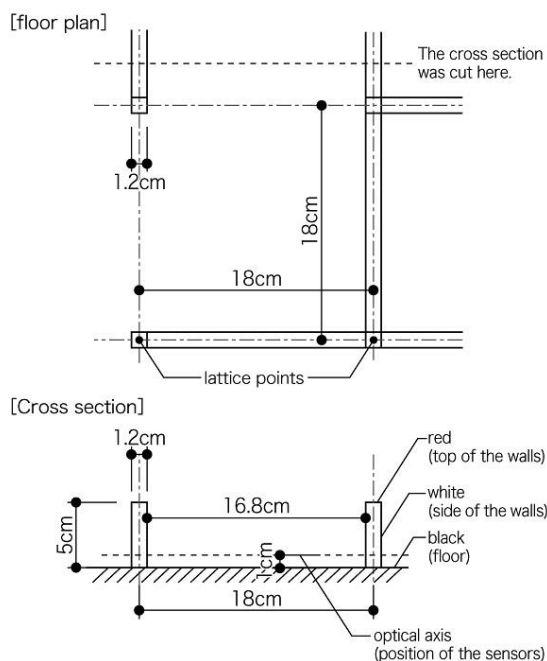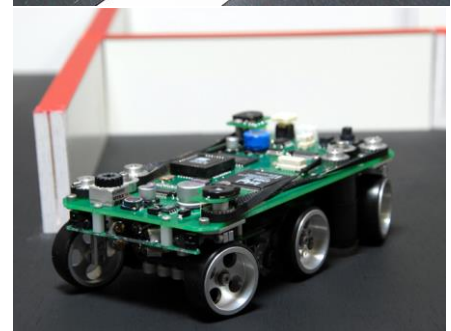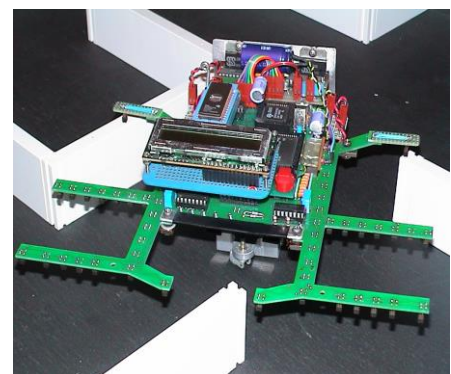

Fig.1：Structure of maze

E. Rules for the Contest

1. Each contesting Micromouse is allocated a total of 10 minutes of access to the maze from the moment the contest administrator acknowledges the contestant(s) and grants access to the maze. Any time used to adjust a mouse between runs is included in the 10 minutes. Each run (from the start cell (Blue boundary in figure below) to the center zone (yellow boundary in the figure below)) in which a mouse successfully reaches the destination square is given a run time. The minimum run time shall be the mouse's official time.

   NOTE, again, that the 10-minute timer continues even between runs. Mice that do not enter the center square will be ranked by the minimum number of cells counted to reach the center square (from the direction the mouse was pointing to). All mice who enter the center square within their 10-minute allotment are ranked higher than those who do not enter the center square.
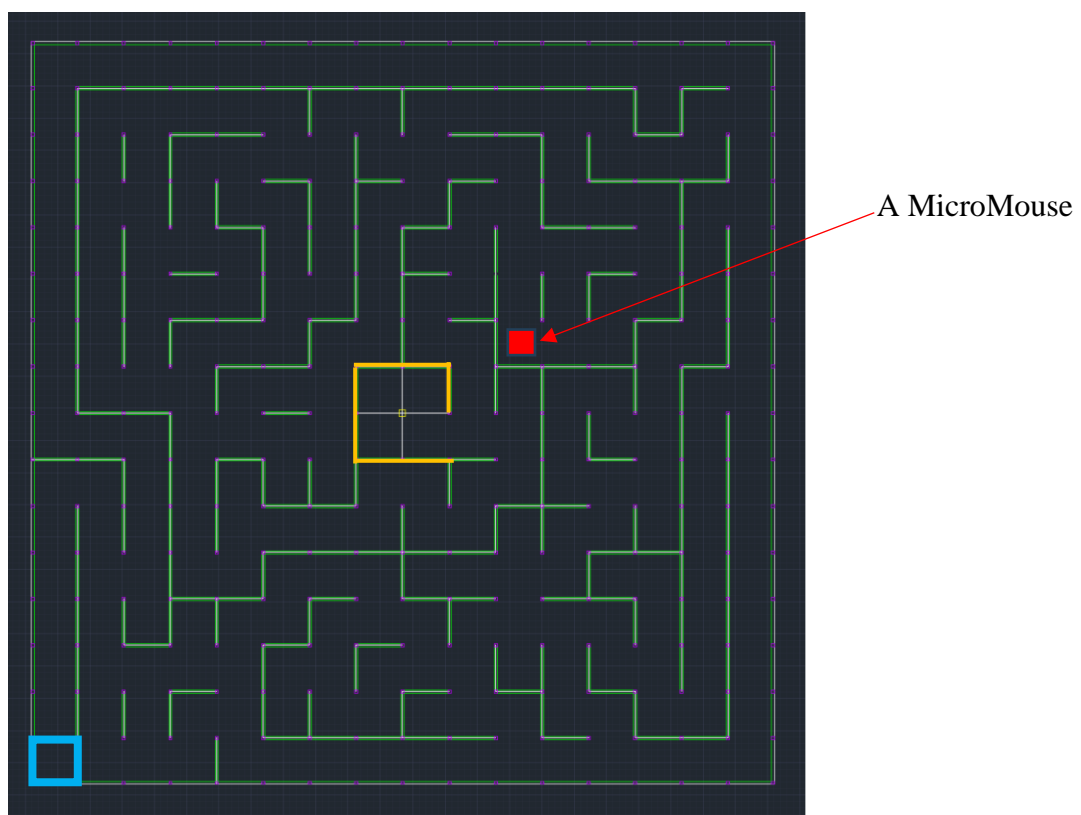
   For example, after the time is up, the micromouse has finished in the position as shown in the above figure. The judges will estimate the fastest route to reach the square center and count how much cells need to reach the goal. (In this case 11 cells needed to finish). The least number of cells will give the team a higher rank.
   The higher-ranking contestants will be qualified to the next stage.

2. Each run shall be made from the starting square. The operator may abort a run at any time during the full operation. If a contestant touches the Micromouse during a run, the run time will be canceled, and the mouse must be removed from the maze. If a mouse has already crossed the finish line, it may be removed at any time without affecting the run time of that run. If a mouse is placed back in the maze for another run after aborting a previous, during the full operation time, a one-time penalty of **30 seconds** will be added to the mouse's next run time.

BEWARE: Every wall hit will result in a 0.5 sec penalty added to the final run score.

3. The final score will be calculated using the rubrics attached in the registration link.

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 mouse crosses the start line and stops when the front edge of the mouse crosses the finish line.

6. Only the final maze score will affect the qualifications for the next stage. The presentation in the judging room will affect the final ranks.

References:

Micromouse Rules 2020 - IEEE. (n.d.). https://r1.ieee.org/wp-content/uploads/2020/02/Micromouse-Guideline-2020.pdf

Micromouse. (n.d.). http://greenye.net/Pages/Micromouse/Micromouse2015-2016.htm

*New Technology Foundation. (2023, August 25). Rules for Classicmouse.
    https://www.ntf.or.jp/?page_id=933*