

MicroMouse Specification

Version 1.1

UQ Mechatronics and Robotics Society

Released 26/06/2021



Introduction

MicroMouse is a classic robotics competition in which an autonomous robotic mouse finds the fastest path to the centre of a square maze. The maze layout is unknown before the competition. Therefore, the mouse must be programmed to initially map the maze, starting from one corner and finding an optimum path to the centre. The team whose mouse can get to the centre of the maze in the fastest time will win.

Team Eligibility and Formation

To participate, each team member needs to be enrolled in a university/tertiary education institution. Students from all year levels are welcome to participate. Team members do not need to be from the same university/institute. Each team should have a maximum of 5 members.

Competition Rules

- The deadline for MicroMouse submission will be 9AM on Saturday 27/11/21, the same day as the competition.
- You must submit the code programmed onto your MicroMouse at the same time as submission.

- No modifications may be made to the navigation algorithm of the mouse following the reveal of the maze on competition day.
- For each team's turn, they will have three minutes with their mouse to make any adjustments/sensor calibrations. No details of the maze or its configuration should be entered into the mouse.
- Teams will be allocated a window of 10 minutes to compete. This will begin with a 3 minute calibration time. The MicroMouse will then be given 7 minutes to solve the maze.
- Teams may choose to end their calibration period early, however this remaining time will not be added onto the 7-minute run window.
- You may adjust the mouse between runs but this will be included in the 7 minutes.
- The MicroMouse will be allowed to make a maximum of 7 runs.
- The run time (time to get to the centre of the maze) will start when the mouse has left its starting square and stop when it finds the centre.
- The starting procedure of the mouse must be simple and not offer any strategic options to the team; the mouse is autonomous and must make these decisions for itself. For example, if the maze has been completely mapped and the mouse is to make a fast run to the centre, this must be decided by the mouse itself.
- No modifications should be made between runs which drastically alter the mouse's weight or profile during run time, such as removing sensor arrays or switching to lighter batteries.
- However, teams will be allowed to change batteries, adjust sensors, and make repairs between runs.
- The mouse may continue to map the maze once it has found the centre.
- Do not make any assumptions about the lighting level in the room.
- Nothing may be discarded by the robot (or leave a trail). This will lead to a disqualification.
- The mouse may not climb nor fly over the walls of the maze (and therefore no drones or UAVs will be permitted to compete).
- Any attempt to destroy walls/parts of the maze by either teams or the robot will lead to a disqualification.
- A team's solution must be robotic. Live mice will not be allowed to compete.

Maze Specification

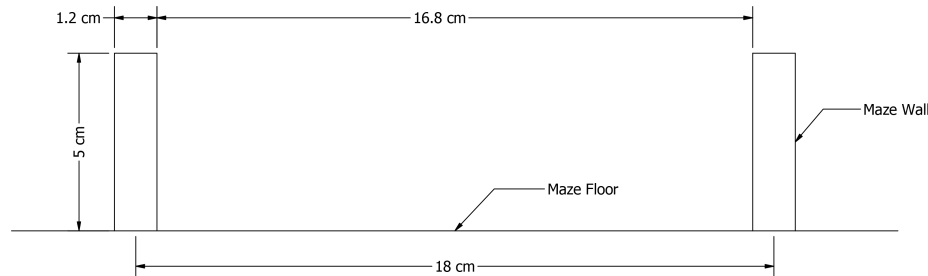


Figure 1: Maze cross-section

- The maze will be made up of a 16x16 unit grid, where each unit length will be 18cm approx.
- The maze will be made of wood.
- The walls of the maze will be 5cm high and 1.2cm thick. Passageways between walls will therefore be 16.8cm wide.
- The outside of the maze will be surrounded by a wall.
- The side of the walls will be white. Wall tops will be red and the floor will be black.
- The mouse will start in one of four corners of the maze. When placed at the starting point, the outside walls will be to the left and behind the robot.
- The centre goal will be an large opening comprised of 4 unit squares (2x2).
- Maze dimensions will be accurate to 5% or 2cm, whichever is less

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- The mouse must be smaller than 16x16cm. Participants should consider the size of their mice carefully and whether it will be able to successfully maneuver the maze. Mice must not utilize combustion or nuclear power sources.
- The height of the MicroMouse must be under 100cm.
- Mice must be controlled by on-board systems. No internet connections or wireless communication is allowed during a run
- The mouse must be autono-mouse ;)

Judging

- Marks will be awarded based off the effectiveness of the mouse to reach the centre, as well as build quality.
- Teams which reach the centre of the maze will be scored off timing. Teams which fail to reach the centre will be scored by distance achieved and purpose in navigation algorithm.
- If the mouse is touched during an active run, the mouse must be re-positioned to the starting cell.
- If judges determine that a mouse is likely to damage the maze or believe it may pose a safety risk, judges may bar the mouse from competing. This may include include interrupting an active run.
- Judges decisions are final.