

CAT AND MOUSE - THE SCAVENGERS

1. OBJECTIVE

The nature of this contest is similar to the Pac-man computer game. It consists of two robots, namely Tom-the-Cat and Jerry-the-Mouse. These two robots have to work together to collect food on the maze. Tom's mission is to bring fish back to the cat's home. Jerry's mission is to bring cheese back to the mouse's home.

Tom and Jerry are to pick up their own food. However they may communicate with each other to help complete the food scavenging as fast as possible. For example, if Tom meets a piece of cheese, it can signal the location of this cheese to Jerry, who will remember to pick up this cheese. Similarly, Jerry may inform Tom of any fish seen on the maze. In the event that a wrong food pallet is collected, additional time penalty will be added to the total time.

The game is completed when all food pellets have been collected, the time allotted is up, or if the handlers request for the clock to be stopped.

2. CAT AND MOUSE SPECIFICATIONS

- 2.1 Any form of mobile robots (wheeled or legged) are acceptable for this competition.
- 2.2 The length and width for Tom and Jerry shall be restricted to a square region of 25 cm x 25 cm. There is no restriction on the height of the robots.
- 2.3 The robot has to be COMPLETELY autonomous.
- 2.4 The Cat and Mouse should not leave anything behind while negotiating the maze.

3. TERRAIN SPECIFICATION

- 3.1 The domain is a flat area criss-crossed by reflective tape forming a 16 x 16 array of 180mm x 180mm (between centres) squares.
- 3.2 The domain floor and its border will be made of wood painted with non-gloss black paint. The squares marking the domain will be constructed with reflective (3M Scotchlite reflective tape) of 10mm width.
- 3.3 There are 2 Home positions marked by the squares located at diagonal corners of the maze. One Home square for Tom-the-Cat and the other for Jerry-the-Mouse.
- 3.4 The tolerances of the domain platform will be within the specifications specified in Figure 1.

4. FISH AND CHEESE SPECIFICATION

- 4.1 The Fish and Cheese shall be flat pellets of 0.5mm thickness, with square (fish) and round (cheese) shapes. They are made of unfinished galvanised steel sheets (0.5mm) which can be picked up by magnet. A sample pellet will be given to each represented institution.
- 4.2 The Fish and Cheese are to be placed at any corner of the squares formed by the tracks. The gap of separation of the track and the Fish-edge or Cheese-edge, should be 10 mm. See Fig.2.

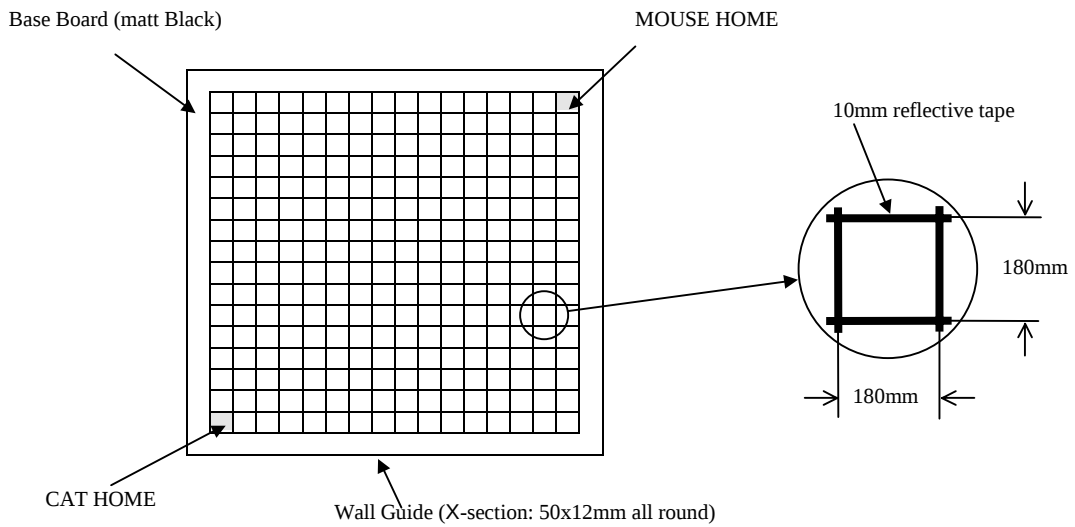


Figure 1: Cat and Mouse - The Scavengers' Terrain

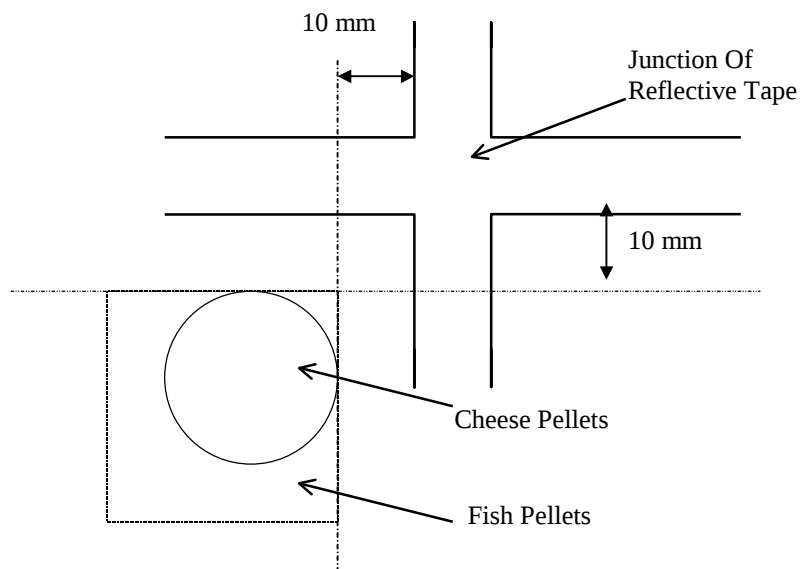


Figure 2: Cat and Mouse - Placement of Food Pellets

- 4.3 At any square, there may be more than one food pellet placed. However, at any intersection of the tracks, there will not be more than one food pellet placed.
- 4.4 The Fish pellet dimension is a square of 3 cm x 3 cm.
- 4.5 The Cheese pellet dimension is a round disk of diameter 2 cm.

5. RULES FOR THE CONTEST

- 5.1 Each run shall be subjected to a time limit of 8 minutes on the maze. Within this time limit, Tom and Jerry may make as many runs as possible.
- 5.2 There will be 5 to 10 pieces of Fish and 5 to 10 pieces of Cheese on the maze.
- 5.3 The robot starts from Home position. It may start in any orientation within the Home square.

- 5.4 Once the robots are out of the Home position, it can only go back to the respective homes with a food pellet. The robot is considered to have returned to Home position when any part of the robot is inside the Home square.
- 5.5 Tom may only deposit Fish in the Cat's home. Jerry may only deposit Cheese in the Mouse's home. The deposit of food into Home position means that the final resting position of the food must be within the Home square and not touching the tape.
- 5.6 Once each food pellet is brought and dropped at Home position, participants may re-position the pellets at the border area outside the maze. This is to prevent the food pellets from cluttering the homes.
- 5.7 The robots must pick up and bring back only one piece of food at each time. While holding a pellet, the robot can touch another pellet provided the second pellet does not touch the reflective tape or go beyond the square grid.
- 5.8 The robots are NOT allowed to touch each other. Once they touch each other while manoeuvring the domain, both robots are considered to have crashed.
- 5.9 The game ends when :
- a. All food pellets has been collected.
 - b. Time of 8 minutes is up.
 - c. Participant request to stop the game(clock)
- 5.10 Judging Criteria :
- The team which is able to collect all correct food pellets in the shortest time shall win.
- In cases where none of the teams have completed collecting all correct food pellets, the following penalties will be added to the time at which the clock is stopped.
- Penalty of 2 minute to be given for each food pellet not taken home.
 - Penalty of 30 seconds to be given to each wrong food pellet taken home.
 - Penalty of 30 seconds to be given for returning to Home without food pallet.
- 5.11 A robot is required to restart from home position, if the following occurs during the competition:
- i. robot has crashed.
 - ii. robot has dropped it's food outside it's home.
 - iii. robot has picked up more than one food pellet at a time.
- 5.12 If the robot is holding a food pallet when i) to iii) occurs the food pallet will not be returned to its original position and will be taken out of the maze.
- 5.13 If the robot is not successful in collecting any food pallets, no scores will be computed.
- 5.14 In the event that a food pallet is moved and it touches the reflective tape, the pallet is forfeited and will be removed.

6. CLONING

- 6.1 In accordance with the spirit of the competition, clones among the winning entries will only be awarded one prize. Clones will be identified during the "caging" as well as after the completion of the run. The vehicles will not be considered a clone if the collection strategies for entries are visibly different through the maze even if the physical appearances are nearly the same.
- 6.2 Clones are robots with substantially identical physical appearance and game strategies. If the vehicles are only similar in one of these categories, the vehicles are not considered clones.

7. CAGING

- 7.1 All entries must be caged ½ hour prior to the start of the competition. This is to allow the organisers time to set up the maze.
- 7.2 During caging, judges will identify potential clones as well inspect entries which contravene rules on robot specifications.

8. JUDGING AND DISPUTES

- 8.1 Decision of the Judges will be final.
- 8.2 Any disputes arising during the competition must be brought up immediately to the judges.