EN 2532
Robot Design and Competition
2019

Task:

- First, the robot must follow a white line on a black surface. While following the line, the robot must pick up colored coin located in square, into a container that the robot may carry; the container is not a must as long as there is mechanism to get the coin attached to the robot.
- After the completion of white line following, there will be color line following. According to the color of the coin, robot must select path and follow the line. While following the colored line, robot must unload the colored coin in square.
- After that it will continue to follow white line and finds the bridge. This white line will be continued on the surface of the bridge, as well.
- Then robot will reach wall maze area. By solving maze, it will come to final part of task.
- In the final part of task, there will be gate for end and will be opened by transferring water from one tank to another tank.

Game Field:

1) The game field consists of an arena having dimensions 12ft x 8ft.
2) The arena contains two-line following areas, coin square, a bridge, a maze, a starting position and a stop position.
3) Both starting and ending squares of the task are 25cm x 25cm white color squares.
4) The coin collecting area consists of white line of 30mm width on a non-reflective matt black surface.
5) There will be ferromagnetic coin (2013 Rs. 2 coin) to be collected. Please refer to the dimensions and weight of those coins.
6) Colored paper will be placed on both flat side of coin. Color will be red or green or blue.
7) The square that contain coin (not necessarily in the center) have the dimensions of 10cm x 10cm.

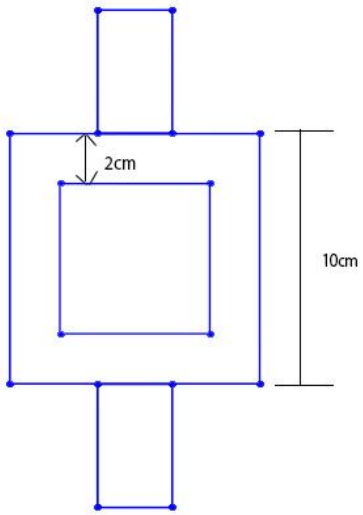

Figure 1 Coin collecting area

8) The coin unloading area consists of three colored lines of 30mm width on a non-reflective matt black surface. Dimensions of coin unloading square will be same as coin collecting square.

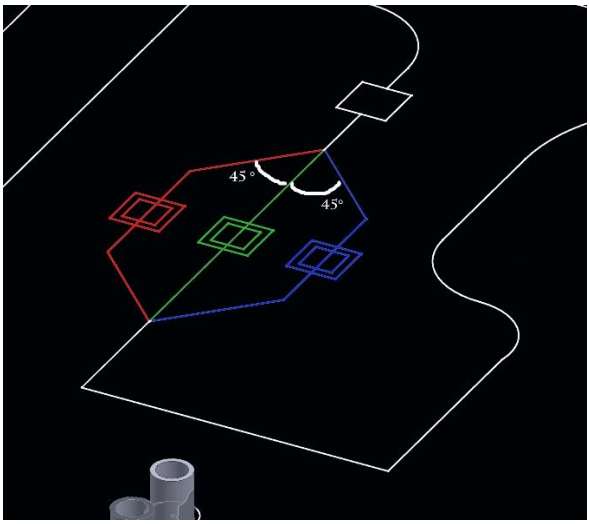

Figure 2 Coin unloading area

9) Dimensions of the bridge section will be as follows:

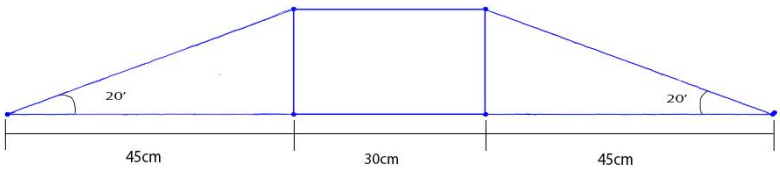

Figure 3.1 Bridge 2D view

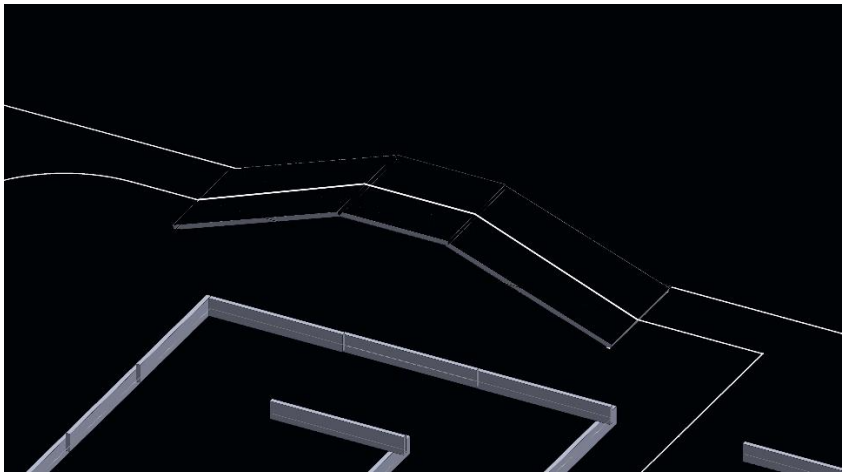

Figure 3.2 Bridge 3D view

10) Dimension of the maze will be 6ft x 6ft. The maze will not contain any loops.

11) The walls constituting the maze shall be 10 cm high and 1.2 cm thick.

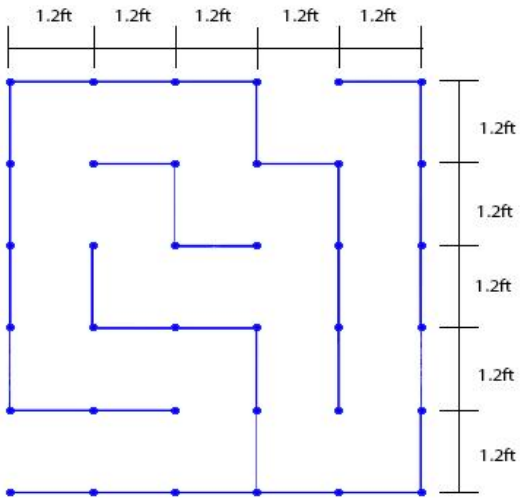

Figure 4.1 Maze area 2D view

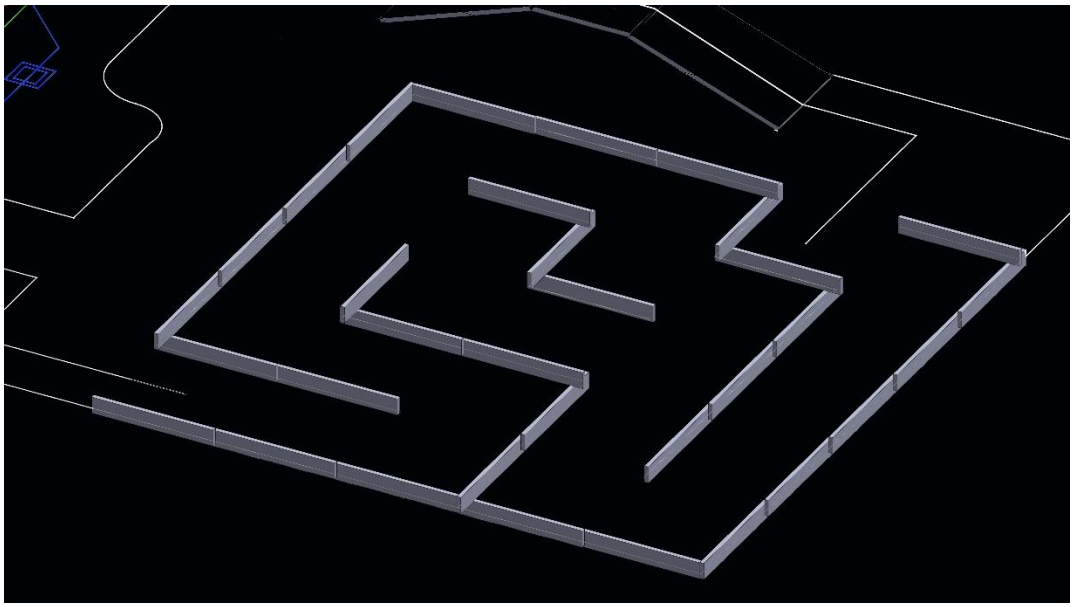

Figure 4.2 Maze area 3D view

12) Last part of the task consists two tanks, one is empty and other one is filled with water and gate which is joined with empty tank.

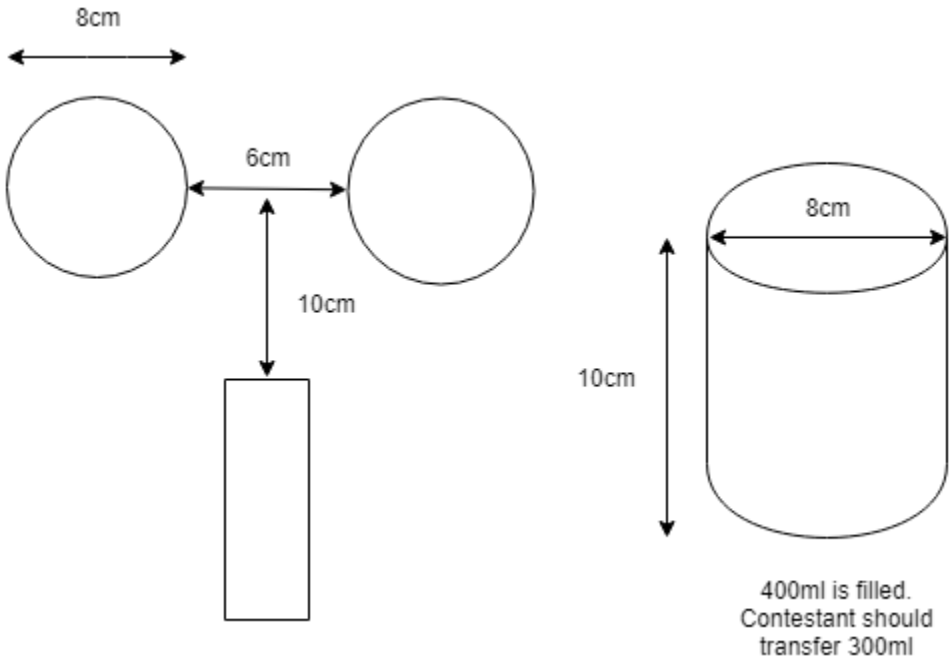

Figure 5 Dimensions for Containers and their Placement

13) Length of the gate will be maximum 35cm and radius of two tanks are maximum 4cm.

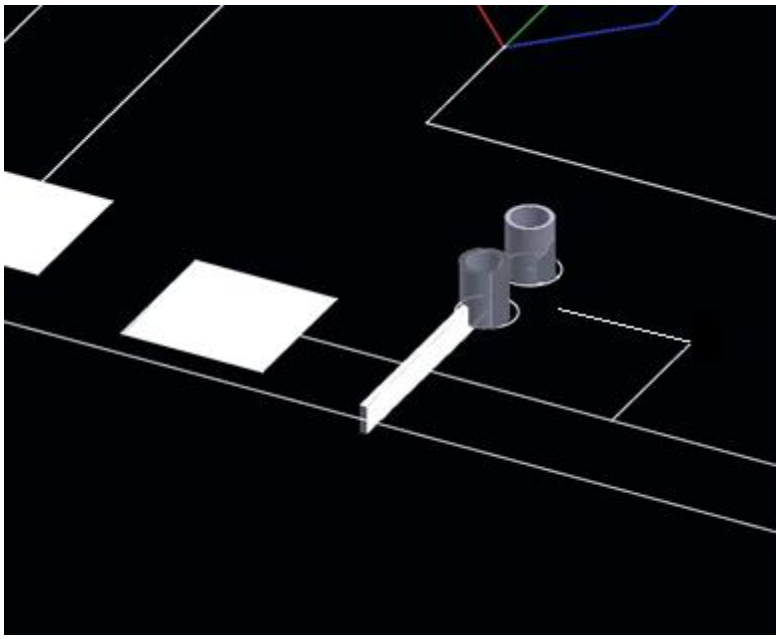

Figure 6 Final part

Arena

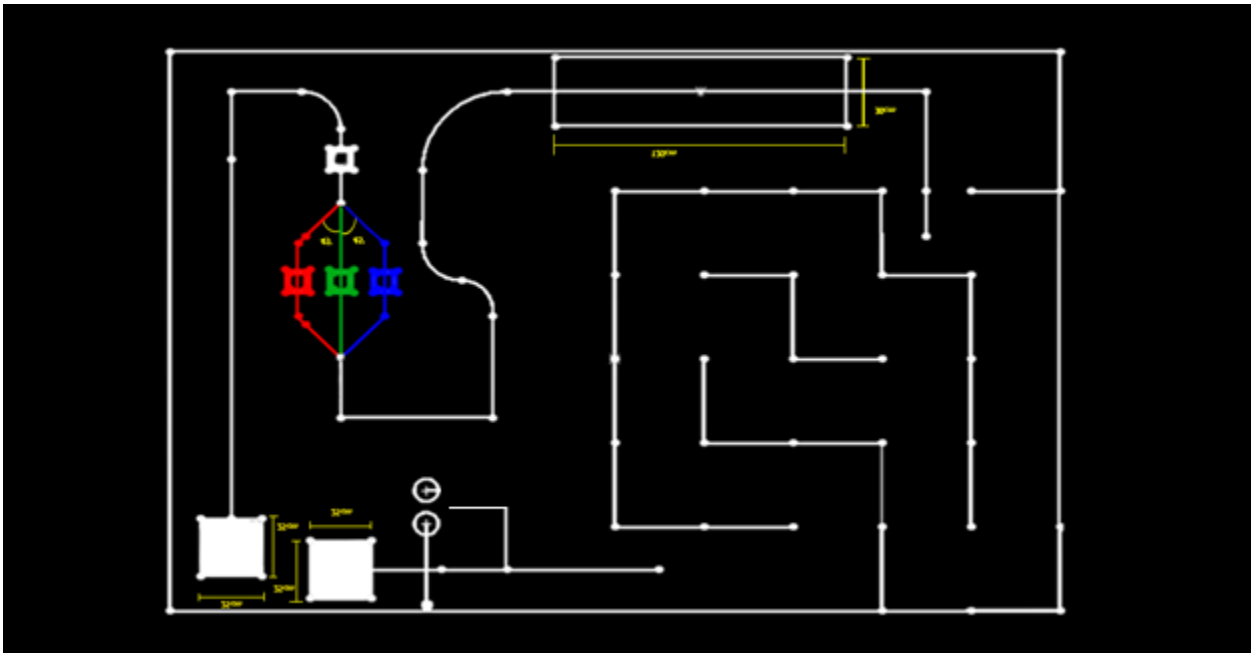

Figure 7.1 Full arena 2D view

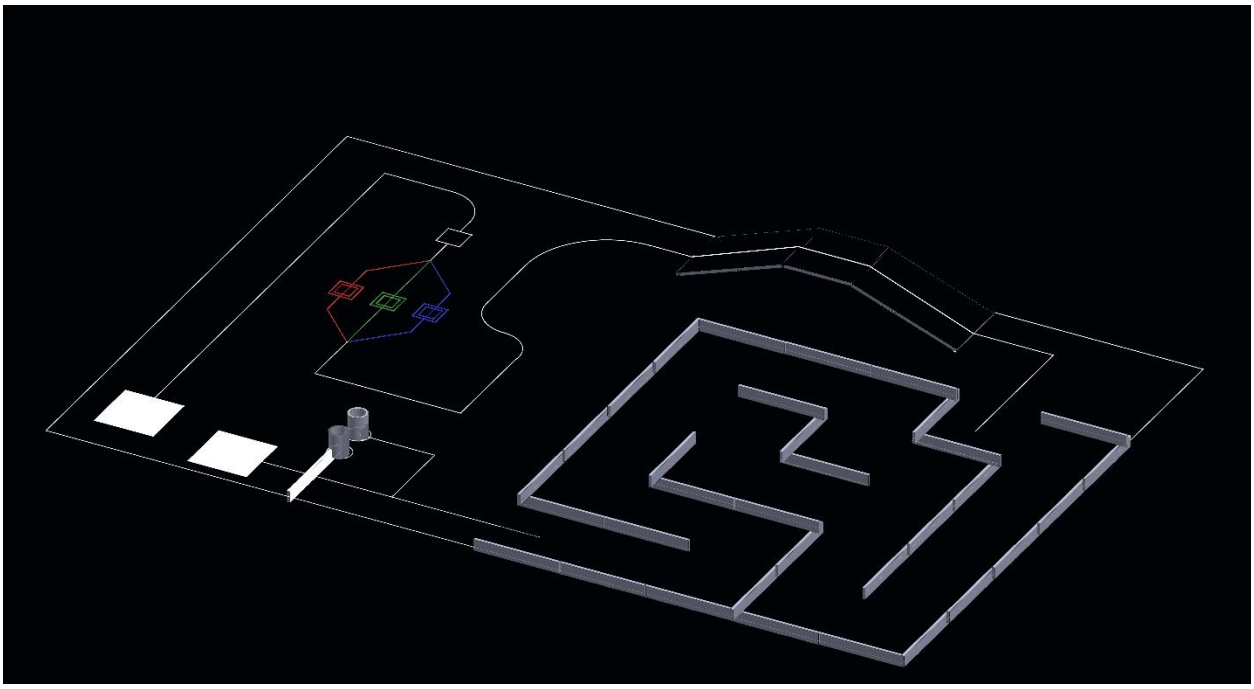

Figure 7.2 Full arena 3D view

Game Rules:

1) The teams will have to submit their bot before the start of the competition. Only those teams which submit their bot will be allowed to participate. The bot will be handed back to the team during the time of their run.
2) They will be given 2 minutes to do any hardware changes if they wish. Under no circumstances they will be allowed to make changes in their code.
3) The maximum time given for completing the task is 10 minutes.
4) No damage should be made by a robot to the arena during the match in any manner.
5) Team members will not be allowed to handle the coins. Only the organizers can handle the coins in any situation.
6) Participants are not allowed to keep anything inside the arena other than the bot.
7) Laptops/personal computers are not allowed near the arena. Other Wi-Fi, Bluetooth, etc. devices must be switched off. The organizers hold the right to check for these devices and their usage and disqualify the team.
8) The organizers may stop the bot at any time if they feel that it is performing or is about to perform any action that is dangerous or hazardous to people or equipment. Robot is not allowed to use any flammable, combustible, explosive or potentially dangerous processes.
9) Teams can take up to 3 Restarts within given 10 minutes
10) During restarts for the bot, a contestant cannot feed any information to the bot. However, contestants can adjust sensors (position etc.) and make repairs. A contestant must not alter a bot in a manner that alters its weight (e.g. removal of a bulky sensor array or switching to lighter batteries to get better speed).
11) All restarts require the approval of the organizers before the bot can be removed from the arena. If the bot was handled within the arena without approval, the run will be terminated.
12) The clock will not be paused during restarts.
13) Robots should not be disassembled until the results are declared.
14) During line following, if a robot deviates from a line and fails to return within 10 seconds then human intervention would be allowed and a restart must be taken.
15) Judges' decision will be the final.

Robot Specifications:

1) The bot must be completely autonomous. After the bot starts none of the team members will be allowed to touch it.
2) The dimensions of the bot should be such that it completely fits in a box of dimensions 250mm X 250mm (l x b). There is no height limitation. Bot must be started individually by only one on-board switch. However, a team may have separate on-board switches for restart. This switch must be shown before the run to the judges.
3) The bot must be stable and must stand on its own at the beginning of the race when put in the start zone. Machines not fulfilling this criterion will be disqualified.

4) The bot can expand itself during the run if it does not damage the arena in any case. It is not allowed to leave any part or any mark behind while moving forward on the arena. If found so, the team will be liable for disqualification.
5) Bot should not split into two or more units at any moment during the gameplay. All machines/units which are touching each other or are in the start zone will be considered as one machine.
6) Teams can use readymade micro-controller boards/readymade sensor kits. However, teams are not allowed to use any wireless modules or readymade Lego kits or any such assemblies. (No off the shelf kits allowed)
7) The starting procedure of the bot should be simple and should not involve giving the bot any manual force or impulse in any direction.
8) Maximum of one robot is allowed per team.

Power Supply:

1) The bot must use an on-board power supply. No external power supply will be allowed.
2) Each team should bring its own power supply.
3) The potential difference between any two points should not exceed 24 V DC.

Controls:

1) The bot must not receive any input from anywhere outside the arena.
2) If any wireless/wired communication is detected, then the team will be disqualified.

Contacts: