IESL RoboGames 2013

School Category

Robot Specifications

1. Dimensions of the robot should not exceed 15 cm x 20 cm (width x length) including all its accessories at any time during the game.
2. Robot should be self-navigating without any sort of remote controlling. The only interaction of the participants with the robot should be starting and if necessary stopping. Any other interaction with the robot will conclude the attempt.
3. Robot must run with the power of an internal power source contained within the allowed dimensions of the robot (without any external power supply).
4. Robot must be completely built by the team itself with their own design ideas.
5. Robot must be wheeled and should not cause any damage to the game platform. Any robot with the potential threat of damaging the game platform will not be allowed to compete.
6. No off-the-shelf kits are allowed except sensor modules and drive gears.
7. Activating robot should be operated by a single start switch that is placed on the robot itself.
8. Robot should have the ability to follow lines and obey instructions given by a barcode type system.
9. The robot should be able to operate under any light condition.

Game Task

The robot will have to follow a white line with a 3 cm thickness on a black background. On the way towards a junction, the robot needs to count the number of indicators to decide whether to turn left or right at the next junction. There will be only three-way junctions.

- Two indicators – the robot should turn right at the junction
- Three indicators – the robot should turn left at the junction

The count of indicators needs to be reset at each junction. The number of indicators relevant to the next junction will restart from zero.

If a robot takes the wrong turn a penalty will be given, but still the robot will be allowed to reach the goal.

The robot's target should be to obey all the instructions and reach the goal in the shortest time.

Game Platform

The game field will be of the dimensions 8ft x 12ft. Refer Figure 1 for a sample of the arena. The actual geometry of the path may differ largely from this sample but the features and characteristics will be the same.

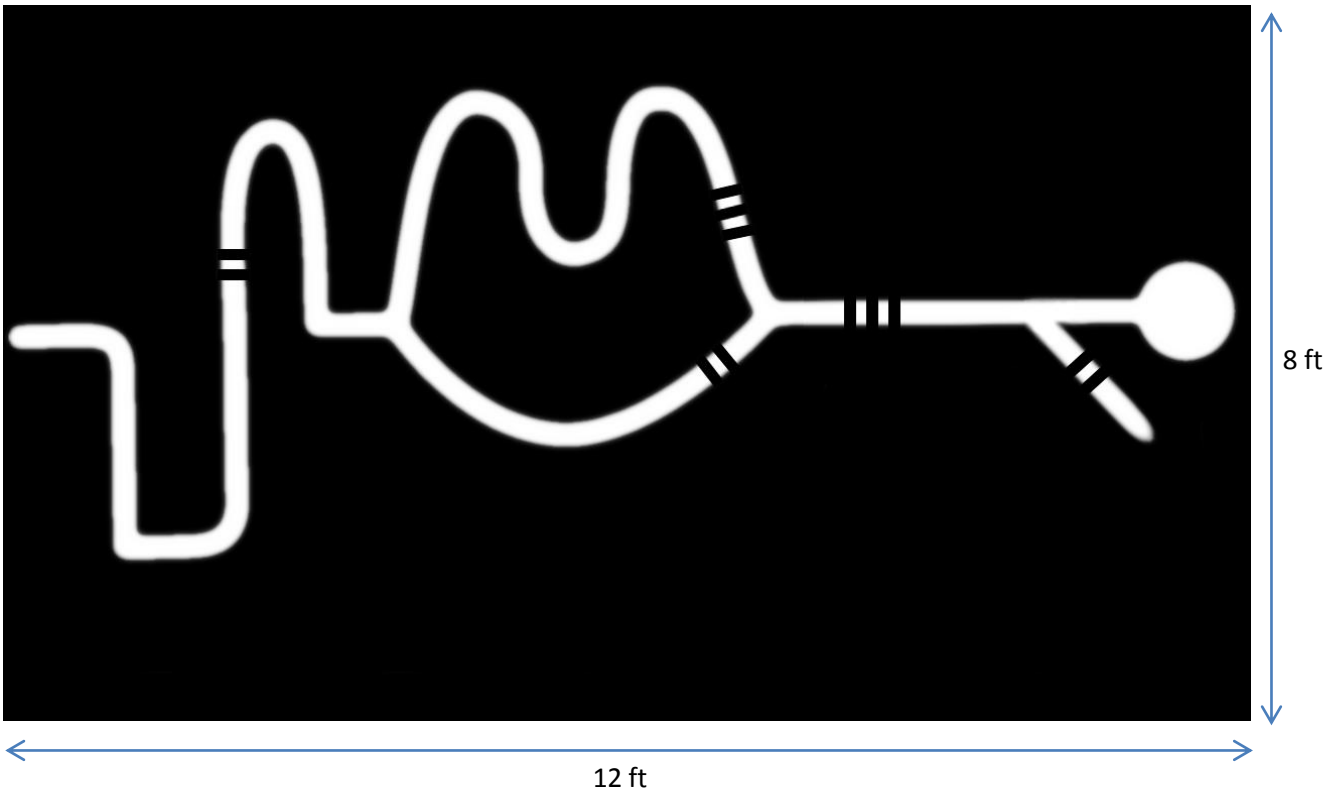


Figure 1

The surface of the field will be black and the path will be in white. The floor will not be perfectly flat, so be ready to face little imperfections.

Features of the path

Start Point:

On the platform there will be a line across the path near the starting end. Participants should place their robot on the path before the line with none of its parts crossing this line. This line will be drawn in a way that it will not interfere with the robot's sensing. It will simply be a reference to the person who places the robot.

Geometries:

The width of the path is 3 cm and the path is in white color on a black background. Path includes curved bends, 90° bends, dead ends and three-way junctions. The angle between two junction roads will be at least 60° and not more than 180°. Parallel road segments will be distanced from each other by at least 10 cm. And each road segment will have at least a 10 cm distance with all the edges of the arena.

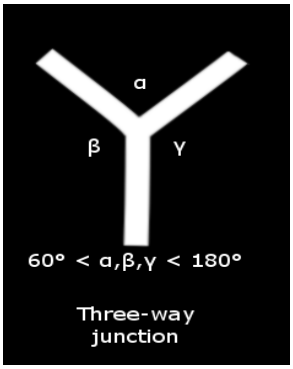
Indicators:

An indicator would be a 1.5 cm thick black strip drawn across the path. The indicators that belong to one instruction (turn left or turn right) are spaced at 1.5 cm. Between two junctions there will be only one such instruction. The path will be straight from at least 5 cm from the beginning of the instruction (set of indicators) and it will stay straight until the end of the instruction. The instructions will not be placed closer than 10 cm to a junction or a dead end. The following are the only two instructions possible (figure 1 shows their applications).

Turn right Turn left

Figure 2

Junctions:



The path will only have three-way junctions. The angle between any two roads at a junction will be at least 60° and not more than 180°. At each junction the robot should choose either to turn left or to turn right based on the most recent instruction received when approaching the junction. It is guaranteed that there will be an instruction before each junction. But the instruction is valid only if the robot is moving in the correct direction of the path segment.

Figure 3

Dead ends:

Wrong turns at junctions may lead the robot to dead ends. A dead end is simply a branch of the path that ends without connecting to another road segment (refer Figure 1). The robot will have to turn around and take the correct turn at the junction according to the instruction.

End point:

End of the path will be indicated by a white circle with a diameter of 20cm. The robot must stop at the end point.

Game Rules

Before a round starts, all robots should be submitted at the arena.

A team will get 10min during which a maximum of three attempts can be made. Grading would take the best attempt.

After the game started for your robot, no team member shall touch the robot. If anyone touches the robot, that is considered as forfeiting the attempt. Each new attempt should start from the starting point.

No trial runs will be given after starting the competition.

A sample of the path will be given separately, only for tuning purposes.

The decisions of the judges will be the final.