

# Legged Robot



## 1. Objective

Legged robot game is to enhance participants' understanding of the programming and mechanical structure of legged robots especially humanoid walking. The participants should be able to construct an algorithm to solve the maze using sensors as well as comprehend a human walking system.

## 2. League

Junior /Challenge League

## 3. Team

2 persons and 1 robot per team

## 4. Game Methods

### 4-1. Junior League

A playground assigned on the game day by the committee will consist of a series of steps/stairs. According to the number of steps assigned on the day, robots must climb the stairs, stop at a pre-assigned area, and solve the maze on the top of the stairs to get to the finish line.

### 4-2. Challenge League

A playground assigned on the game day by the committee will consist of a series of steps/stairs. According to the number of steps assigned on the day, robots must climb the stairs, stop at a pre-assigned area, and solve the maze on the top of the stairs to get to the finish line. There may be stairs going up and stairs going down.

## 5. Playground

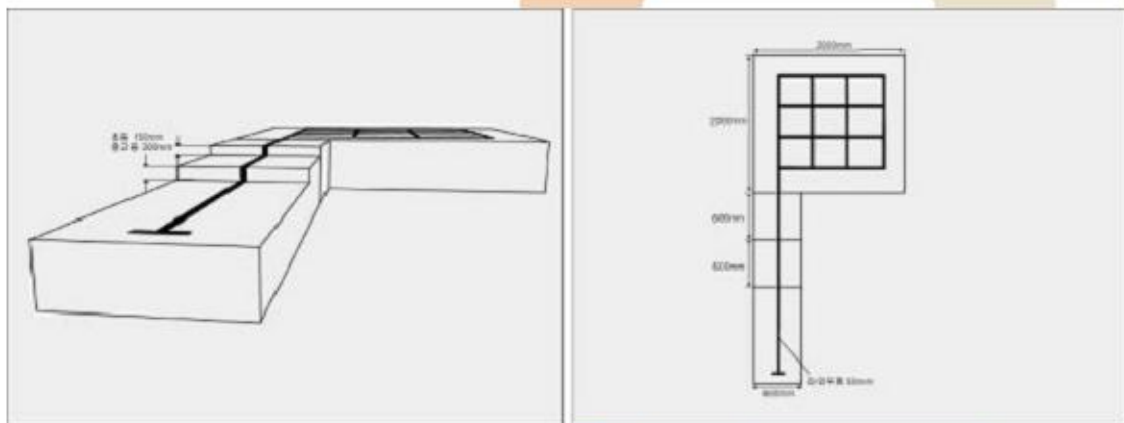
5-1. For Challenge League each stair size is 60cmX60cmX3cm (lengthxwidthxheight).

5-2. For Junior League, stair size is 60cm X60cmX1.5cm (lengthxwidthxheight).

5-3. A 5cm wide black line is drawn on the middle of the steps that leads to maze solving line.

5-4. The maze solving playground will be connected to the stairs, it can be placed before or after the stairs.

5-5. Example of playground



\* Please note that this picture of playground is only an example.

## 6. Game Rules

6-1. The robot excluding the controller must be built during the construction time by the participants. The robot controller can be pre made. Robots construction time is 3 hours

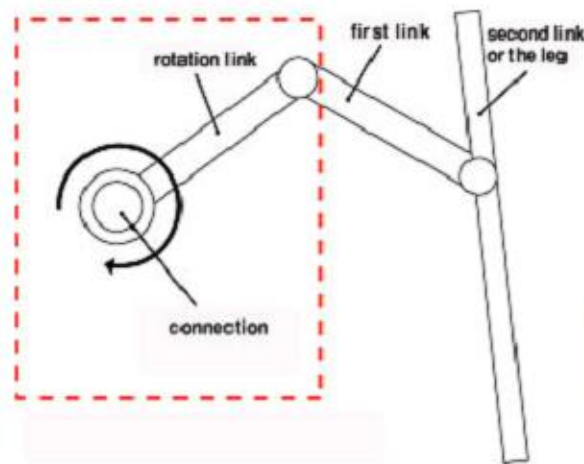
6-2. Robots must be battery powered.

6-3. With the exception of starting the robot, the robot must be fully autonomous.

6-4. Robots must go up or down the steps one by one. For every step, the whole body of the robots should be within the area of the stair.

6-5. Robots' size is not restricted. But the size of the robots should be changed appropriately according to the size of the playground . Otherwise, the team will be disqualified.(??)

6-6. Robots' action should be performed by leg-shaped component or corresponding component utilizing leg moving mechanism. Please refer to the Pic. 1.



[Pic. 1]

6-7. Robots, which use wheels or caterpillars for movement, will not be admitted.

6-8. Computer is allowed for programming. Each team must use its own laptop for programming..

6-9. Robots must stop more than 3 seconds on the finish line.

## 7. Method of Scoring

7-1. Ranking is decided by the average of two recorded tracking time.

7-2. The participant must build the robot to be detected by the measuring instrument. If the measuring instrument cannot detect the robot, the run must be restarted. If the robot still cannot be detected after 3 trials, the participant will be disqualified. If the measuring instrument malfunctions, judges may give extra time to the team before restarting the run.

7-3. If any team member touches the robot during the match without permission from the referee, the team will be disqualified.

7-4. Any other issues that are not mentioned here will be discussed by the committee. The resolution of each issue will be announced to the participants and will be considered final. No further objections will be accepted

## 8. Tie Breakers

8-1. When there is a tie, the faster robot in the first run is the winner.

8-2. If there is no team that completes the mission, the team that completed more mission will be the winner. If there are still tie, there will be a new game for the tie breakers.

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