MAZE ROBOT

DESCRIPTION

Robot maze consists of the creation of an autonomous robot capable of crossing a maze from beginning to end in the shortest possible time.

The maze will feature dead ends, T-junctions, and 90-degree turns to the right or left.

TECHNICAL CHARACTERISTICS OF THE ROBOT

The necessary regulations for the robot maze competition are detailed as follows:

1. The robots will have maximum dimensions: length and width 10 x 10 cm, and there are no weight restrictions.
2. The robot must have an on and off system, either outside the robot or wirelessly.
3. The robot cannot expand its dimensions during the competition.
4. Robot control type: autonomous. The robots must be completely autonomous in terms of locomotion, data acquisition and processing.
5. Sensors, batteries and other robot accessories must be built into the robot.
6. The robot can have an artificial vision system.
7. No external communication system of the robot is allowed.
8. The robot must not leave marks or traces on the maze. It also cannot cause significant damage of any kind in the maze or work area.
9. The robot must solve the maze by using algorithms. The algorithm to be used will be up to the team. The use of previous indications to the robot through hardware will not be allowed.
10. Teams will not be allowed to make hardware or software changes to the robot during play offs. However, it is fine to make minor repairs.
11. The robots must consist of hardware and software designed by the participants. The type of system controller is up to the user. The use of development cards and/or modules will be allowed (Arduino, Raspberry pi, Baby Orangutan, Orange pi, Pic32 Pingüino, Node MCU, etc.). Commercial robots or robots built upon development kits of any kind (examples: LEGO, mbot, roboblogs, pololu, etc.) will not be allowed. If you have any questions, please contact the Organizing Committee.
12. The structure or chassis of the robot must be designed and built by the student with any type of materials (or printed in 3D). The participation of robots created with commercial robot structures or chassis is prohibited.
13. The participating robot is only allowed to go through the corridors of the maze. It cannot fly, jump or climb the walls of the maze.

CHARACTERISTICS OF THE ROBOT WORK AREA

The characteristics of the track will be the following:

a. The maze will be made of wood.
b. The walls will be 15 centimeters high 1.2 centimeters thick, admitting a measures variation of 4%.
   The corridors of the maze will have a width of 30 centimeters and gates 30 cm.
c. The dimensions of the crossing paths will be composed of internal squares of 30x30 centimeters.
d. All the crossing paths will be perpendicular.
e. The walls will be entirely painted in any color but black.
f. Stage lighting is not guaranteed to maintain the same hue throughout the maze.

HOMOLOGATION

The judges will verify that the technical specifications of the robot are satisfactorily met.

COMPETITION DEVELOPMENT

1. All robots must have their batteries fully charged before each phase; recharging of these between races will not be allowed.
2. Robots will be collected before the start of each playo off round, in order to avoid software changing, hardware and battery recharging between turns.
3. Robots will be located and protected in the judges' area. The prototypes will be given to their respective owners at the end of each round.
4. The order of participation will be random.
5. Robots will have three attempts to solve the maze; the best attempt will be recorded.
6. Time will begin when the robot starts to move, and ends when the robot leaves the maze or when the participant decides to take it away.
7. The maximum time for each attempt is four (4) minutes.

EVALUATION

1. The robot that solves the maze in the shortest time possible will be the winner.
2. If neither team can complete the trajectory, the winner will be determined by two criteria:

a. The robot that came closest to the exit of the maze.
b. The robot that came closest to the exit of the maze in the shortest possible time.

JUDGES

I. The role of the judge is important in the competition, he will be in charge of complying with the rules and regulations established by the organizing committee.
II. The judges for this competition will be appointed by the organizing committee.
III. Contestants may present their objections to the judge in charge of the category before the end of the competition.
IV. In case of doubt in the application of the norms, the judge will make the final decision.
V. In the event of a controversy about the decision of the judge or judges, a written disagreement can be sent to the Council of Judges. Once the competition is over, the arguments presented will be evaluated and a decision will be made in this regard. This decision is final.