

ROBOT SOCCER

GENERAL INFORMATION

In this category, two teams compete on a soccer field. Each team will have three (3) robots that will move guided by three operators (one for each robot) through wireless communication controls. The Robot Soccer match consists of two halves in which the robots will try to score a goal on the opposing team's goal. Once the second half is over, the jury will determine the winning team based on their performance during the match.

DIMENSIONS AND TECHNICAL CHARACTERISTICS OF THE ROBOT

Dimension:

1. Robots must have a maximum of 10x10 centimeters (length and width) with the trigger not deployed, without tolerance.
2. There is no restriction regarding height.
3. The trigger stroke must not exceed 5 centimeters in length.

Design:

1. The design of each robot is free.
2. The structure of the robot must be fixed except for the trigger; that is, it is not allowed to deploy and retract structures that might affect the robots of the opposing team during the match.
3. The type of traction of the robot is free: wheels, caterpillar-type band, articulated legs, worm-type, etc.
4. Traction will be provided by electric motors: direct current, stepper or servo motors.

Restrictions:

The only wireless communication system allowed with the robot is on and off.

The robot must perform completely autonomously throughout the journey.

The robots must include 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 Pinguino, 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.

Materials:

1. 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.
2. Number of motors to be used is up to the competitors.
3. Robots will be powered by batteries: the use of fuels (combustion engines) or any flammable material is prohibited. No robot must be externally powered via cables.

Control:

1. Competitors are allowed to use any type of wireless communication.
2. Each robot must have a device with at least two different frequencies, which must be indicated at the time of registration in order to avoid interference between the control systems of the opposing robot. In case of coincidences between the control frequencies of the robots, the organizers will assign the frequency with which each team will participate
3. The control interface must be physically isolated from the robot.

BALL:

A standard golf ball will be used:

- 46 gr of mass, approximately
- 43mm diameter, approximately

If the ball gets defective during the game, the match will be stopped to replace the ball and the game will continue in the same position in which the game was stopped.

The ball will be replaced only with the authorization of the referee.

FIELD

The dimensions of the field are detailed in image 1.

Stepping on the field is not allowed.

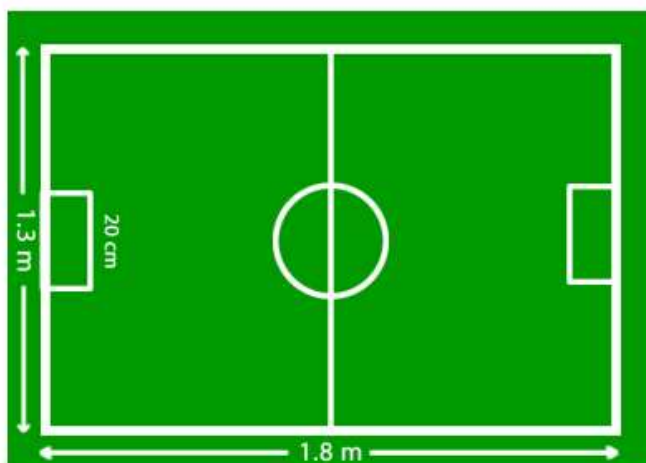


Imagen 1: Cancha de soccer

THE COMPETITION. ROLE OF MATCHES

The turns of the match will be determined by a draw that will be done in the presence of the judges and must be fully complied with.

The teams will face each other in a match of two (2) halves of three (3) minutes each, with an interval between time of one (1) minute.

ROUTINE OF EACH MATCH

The team that starts the game will be designated by a draw made by one of the judges prior to the match. The operators of the participating robots will enter the game area and place their respective robots in the corresponding starting position.

The robot operators will stand behind the arch corresponding to their team.

INTERRUPTION AND RESUMPTION OF THE MATCH

The match will be interrupted at the request of the judges in the following cases:

1. If any of the robots has defects, the operator may request time (one minute and only once for each time) to repair it.
2. Whenever they consider it necessary to deliberate or allow the operators to enter the match area.

If the match gets interrupted, it will be restarted from the position in which it was stopped. Battery changes will not be allowed. The final decision will always be made by the judges and it will be concluding.

END OF THE MATCH

The match will end in any of the following circumstances:

- a) When the time has run out.
- b) When any of the robots has suffered any damage caused by the opposing team or by other causes, which prevents it from continuing to play.

After the end of the two halves, if there is still a tie on the scoreboard, three penalties per team will be shot. After that, if there is still a tie, each team will shoot a penalty. The first team to miss a penalty will be lose the game.

PENALTIES

Penalty shooting:

- a) The ball will be placed in the center of the field. The shooter has to stand across from the ball and cannot take impulse to hit the ball.
- b) The robot must cause the movement of the ball only with its trigger; that is, the ball is not allowed to be dragged, nor is the ball allowed to be hit with any other part of the robot.
- c) The penalty must be made alternately by the members of the team, as a relay. That is, after a robot has shot a penalty, the next penalty must be executed by another member, and so on. (*)
- d) If the team has two players on the field, then the alternation will be between these two players.
- e) The shooting of all penalties will be done without a robot goalkeeper in the goal that gets the shot.
- f) Penalties can only be shot ONCE.
- g) (*) For penalties that are shot as a result of accumulated fouls during the match, the same player can shoot, at the team's decision.

FAULTS

The following actions are considered faults and will be sanctioned by the judges:

1. Taking more than a minute to resume the game after having requested time.
2. Accelerate or move the robot before the referee says so.
3. Hitting, ramming or immobilizing the opposing team's robot.
4. Cause any type of damage to the field.
5. Offensive cheers or damage to the field caused by the fans accompanying the team.
6. In the event that a player's shooter has the characteristic of retaining the ball, it may do so in a maximum of four seconds, otherwise it will be counted as a foul.
7. If the robot has committed three (3) cumulative fouls (within the two halves of the match) a penalty will be shot in favor of the opposite team.

GOALS

1. A goal is scored when the ball completely passes the goal line.
2. Own goals are taken into account as a goal.

DISQUALIFICATION OF THE MATCH

The following actions will lead to disqualification (in which case the match will be automatically lost):

- a. Deliberately hurting the opponent.
- b. Insulting the judge or members of the opposing team.
- c. Using flammable devices.

LOSING BY DEFAULT

1. Not showing up to the event.
2. Having only one robot ready to play (there must be at least two on the court ready to play).
3. Taking more than five minutes to appear on court.

DISQUALIFICATION FROM THE COMPETITION

In extreme cases, the judges reserve the right to expel from the competition those who they consider.

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.