



## **RULE of ROBOT SOCCER**

### **STEAMCUP INDONESIA 2016**

#### **1. OBJECTIVE**

- a. The mission of robot soccer is to build a robot that can **dribble** and **kick the ball** to goal.
- b. The objective of this game is to practice the mechanical creativity, control skill, time management, teamwork, and leadership of players.

#### **2. ROBOT**

- a. There are three robot in one team.
- b. Each robot can be controlled only one players.
- c. One of the robots inside of team must be assigned as the goalkeeper.
- d. Each robot must have a kind of mechanic that used for kick the ball. For example can see in Figure 14 and 15 inside addition rule 5.c

##### **2.1 Size and Wight**

- a. The size of robot is limited to 15cm(L) x 15cm(W) x 15cm(H).
- b. Any transform or extension during the game must be within size limitation.
- c. The weight of each robot is limited to 500g.

##### **2.2 Specification**

- a. The robot can build all type robot, like educational robot kit, modified, or can build own robot.
- b. Only one controller for one robot.
- c. The robots must be motorized and able to move.
- d. The robots must be powered by independet power source, such as batteries.
- e. The maximum power source is 9VDC.
- f. All robots should be built with IR Transceiver Bluetooth or other device modules that canbe able to be controlled wirelessly with remote controller or smart phone.
- g. All robots should be assembled and programmed before the game.

##### **2.3 Prohibition**

- a. All sharp, liquid, powdered, meshy, sticky, flammable, explosive materials are prohibited.
- b. Any robot that damage the platform or hurt people will be disqualified immediately.

##### **2.4 Number patch**

- a. Each robot must be labeled with the name and number of team on visible area of the robot.
- b. The minimum size of patch is 5cm and the minimum height of the number is 4cm, as showed in figure 1.



- c. All number patches in the same team must be in similiar design and color, but with different number.
- d. Number “1” is reserved for goalkeeper, and other robot can be labeled as any integer number between “2” to “9”.
- e. Once the game started, the number of each robot cannot be changed.



Figure 1 size of Name patch

### 3. SETUP THE GAME

#### 3.1 The Field

- a. The game field is on a hard rectangular in **220 cm(L) x 120cm(W)**, excluding the goal as in figure 2.
- b. The field is surrounded by sidewall with height of 15cm as in figure 2.
- c. The center circle have a radius of 20cm and a circles in dark green with radius of 20 cm in around each free ball point(FB).
- d. The goal is 40cm wide. And goal line is the line just in front of the goal.
- e. The penalty areas are the area contained by the 50cm (L) rectangle in front of the goal.
- f. The field is surrounded by sidewall with height of 15cm as shown in **Figure 4** .
- g. the arc with radius of 20cm to the penalty-kick point, and the goal itself
- h. The actual field size may have 5% tolerance to all measuremnt above.

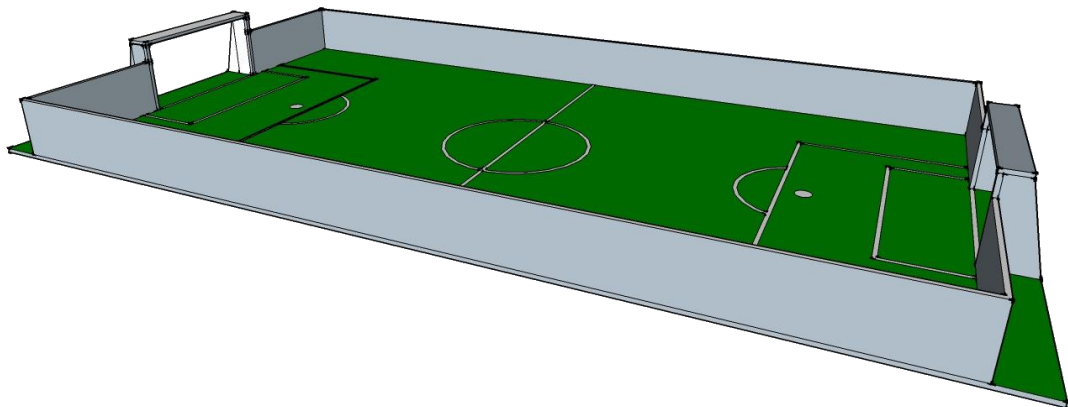


Figure 2 The field in 3D



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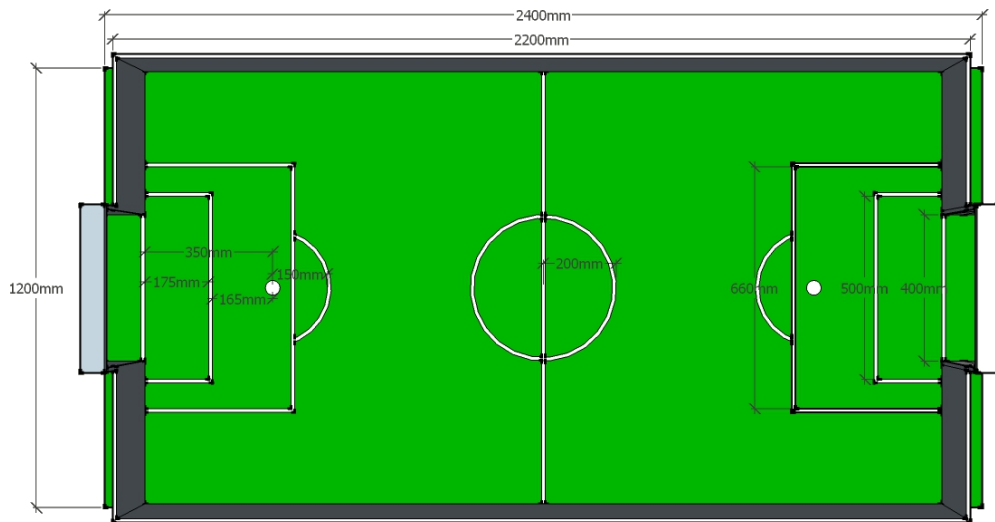


Figure 3 The field with Measurement

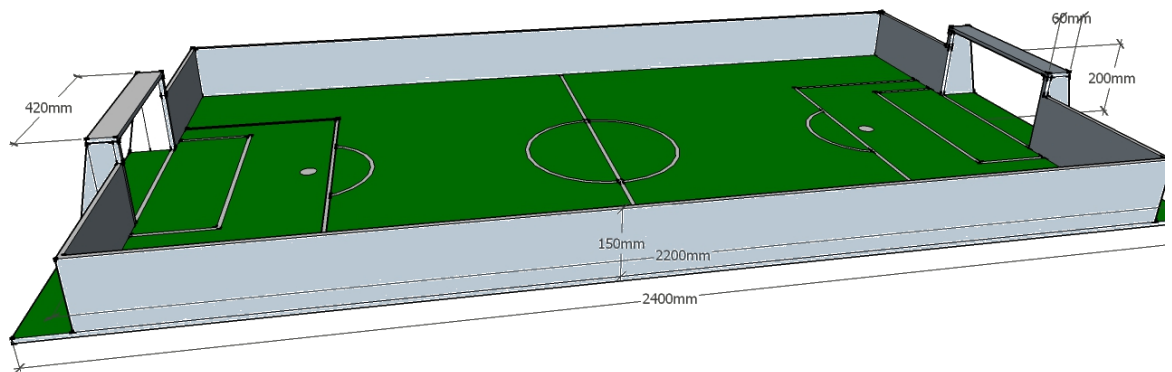


Figure 4 The 3D field with Measurement



Figure 5 The Ball

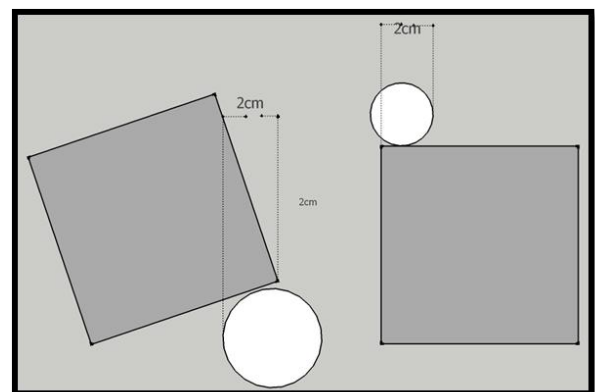


Figure 6 Foul 4.5.2.1 (example)



### 3.2 The balls

- a. A standard golf ball is used as a ball.
- b. Example of the ball can see as figure 5.

## 4. THE GAME

### 4.1 Game duration

- a. For group round robin games, each game lasts for three (3) minutes without interval.
- b. For knock out games, each game includes two (2,5) minutes first half, one (1) minute half time interval and two (2,5) minutes second half.

### 4.2 Preparation

- a. Players must be ready with robots in three minute once referee called for start.
- b. The robot must be turned on, ready to be controlled and placed in start boxes before the game starts.
- c. Referee will blow whistle as a sign to start the game, then the players can start controlling the robots to move, pick and throw in the balls to basket at opponent's half.
- d. After every goal in the game, the team who lost the goal takes the next kick-off as attacking team.
- e. When kick-off as in Figure 7, the attacking robots will be allowed to stop freely in their own half or within the center circle. While the defending robots can stop freely in their own half except within the center circle. Then the ball is placed at the center point by referee manually, and the game starts with referee's whistle.

### 4.3 Kick-off

- a. Kick-off will be run when start of each half or after a goal.
- b. After every goal in the game, the team who lost the goal takes the next kick-off as attacking team.
- c. When kick-off as in Figure 7, the attacking robots will be allowed to stop freely in their own half or within the center circle.

### 4.4 Interruption, time and with drawing

- a. All player must stop all robots when referee whistles to interrupt the game in following condition
  - a. End of each game.
  - b. Any foul is called.
  - c. A team calls for time out (each team only call once in each game), allowed for 1 minute for timeout.
  - d. Emergency situation that may damage the field or hurt the players and audience.
- b. The time of game keeps running even in interruption.
- c. The robot has to be placed on the specified area to reenter the field if player withdraw the robot from the field during interruption :



- a) For kick-off, free-ball and free-kick, the reentering robot must be placed on the corners of the own side, as in Figure 7, Figure 8 and Figure 11.
- b) For penalty-kick, only the reentering goalkeeper of defending team can be placed at corners of defending team, all other reentering robot must be placed at the corners of attacking team, as in Figure 13.
- d. If withdrawn robot is not ready in ten seconds, the game continues without it. Once it is ready, the player should ask permission from referee to reenter the field.

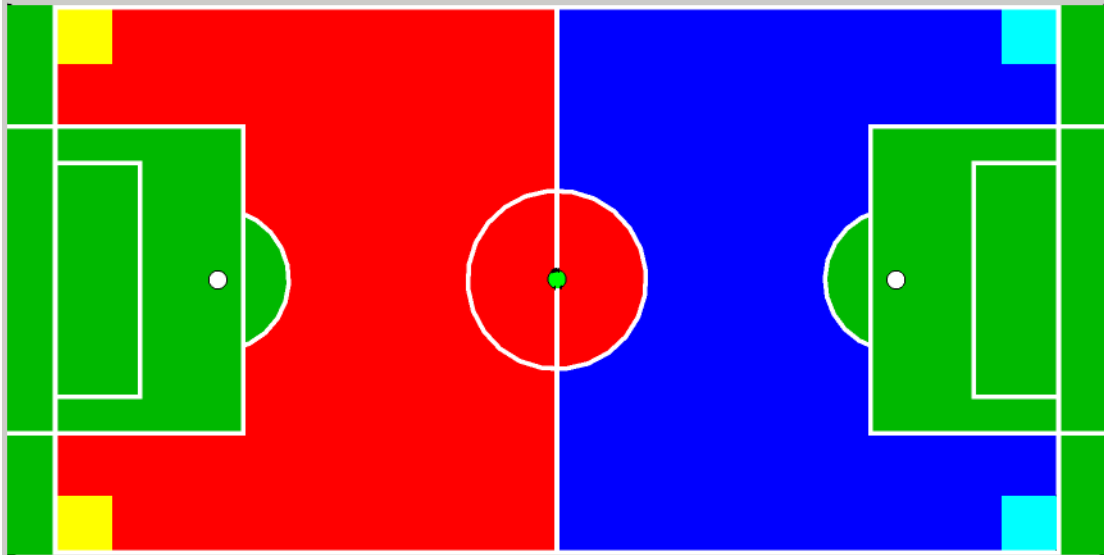


Figure 7 Kick-off (example, red team is attacking)

(Attacking robots must be in Red region and defending robots must be in Blue region, while withdrawn attacking robots reenter from Yellow region and withdrawn defending robots reenter from Cyan region)

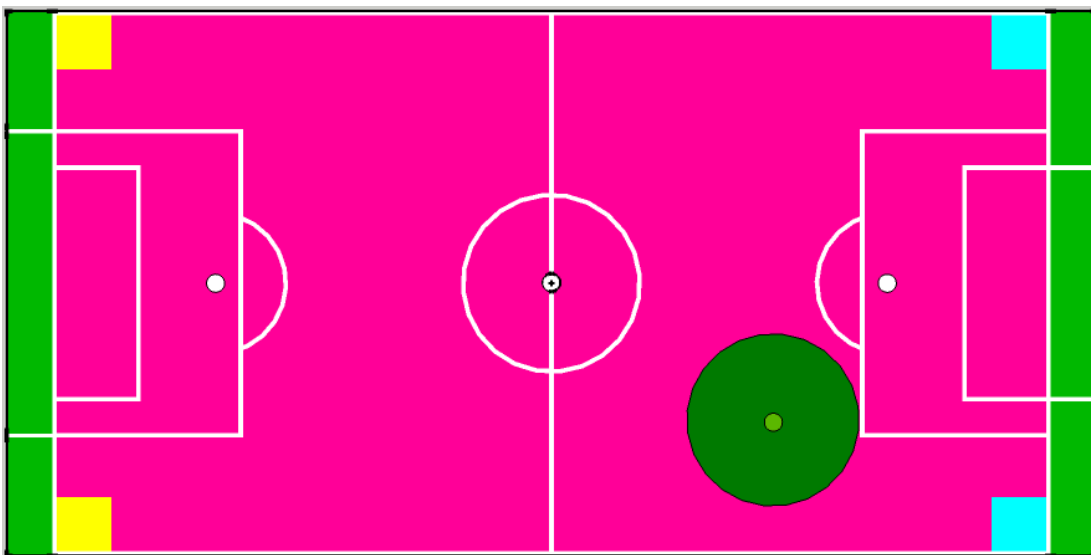


Figure 8 Free-ball (example, ball on bottom right free-ball point)



(All robots of both team must be in Magenta region, while withdrawn attacking robots reenter from Yellow region and withdrawn defending robots reenter from Cyan region)

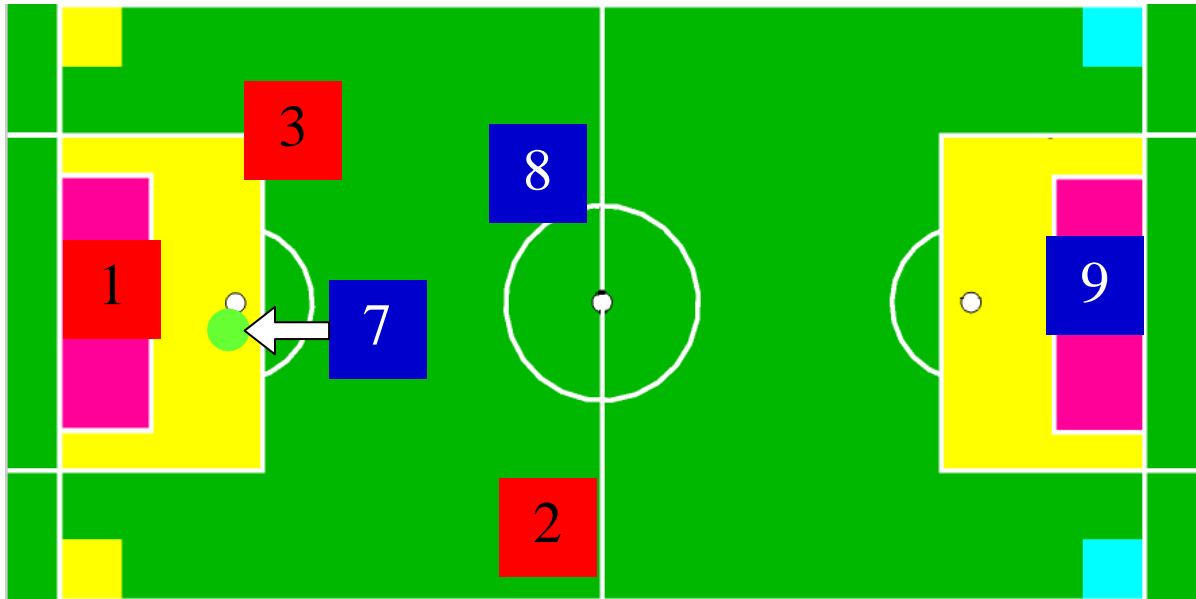


Figure 9 Kick The Ball (Example Blue Team is Attacking)

(All robots of both team must have a kind of mechanic for kick the ball, when one robots from blue team make a goal without doing a kick motion, so the blue team is not scored. Then the ball give to opponent goalkeeper as free ball. Robot allowed kick the ball inside or outside the Yellow region but not dribbel the ball to make a goal.

#### 4.5 Foul

- The player touches any robots, the ball or the field without permission from referee.
- The player does not follow instruction from referee.
- The player commits unsupporting behaviour towards an opponent, a team-mate, the referee, or any other person.
- A yellow card may be shown to player as warning.
- Two times of yellow card is turned to a red card, the player and robot must be sent off the game.

##### 4.5.1 Free-ball

A free-ball is called if :

- The ball is out of the field accidentally
- Both teams make fouls at the same time
- Robot kick the ball inside Cyan region



#### 4.5.2 Free-kick

A free-kick is awarded to the opponent team if robot kicks the ball out of the field. A player is shown a yellow card and a free-kick is awarded to the opponent team if :

- 1) The attacking robot covers or carries more than 2cm depth of the ball and scores a goal.
  - 2) The goalkeeper is over the center line into opponent's side, as shown in Figure 10.
  - 3) The player touches any robots, the ball or the field without permission from referee. (Players can only touch the robot under Rule 4.4.d)
  - 4) The player does not follow instruction from referee. (The free-kick is turned to penalty-kick if the player makes foul during interruption for free-kick of opponent's team.)
  - 5) The player commits unsporting behaviour towards an opponent, a team-mate, the referee, or any other person.
- e. When a free-kick is called, the ball will be placed manually by the referee. All robots of defending team must be more than 20 cm away from the ball, as in Figure 8.

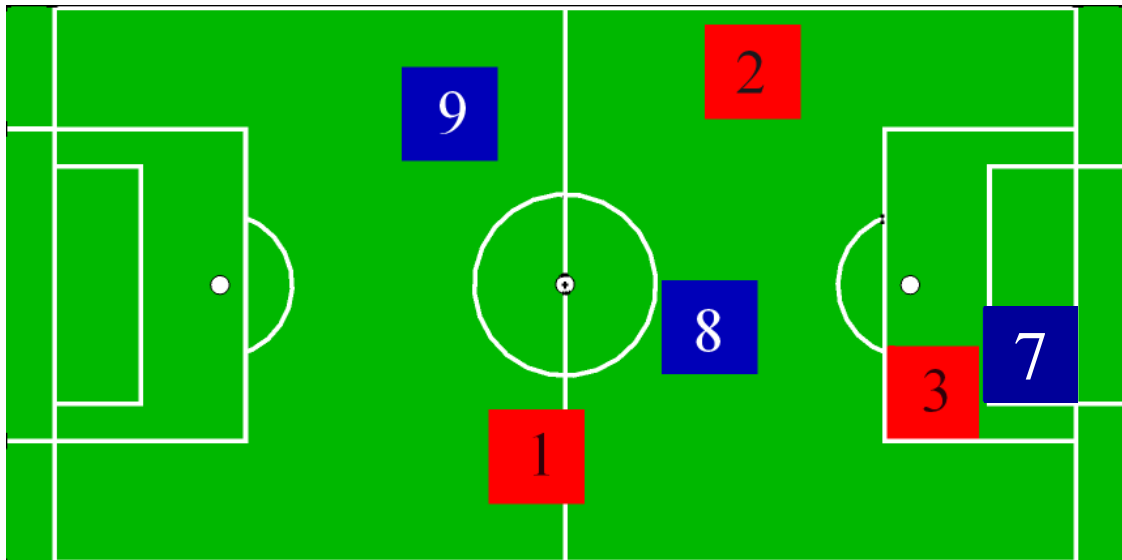


Figure 10 Foul 4.5.2.b.c (example)

(Foul is called to Robot "1" as goalkeeper of red team because it is over the center line).

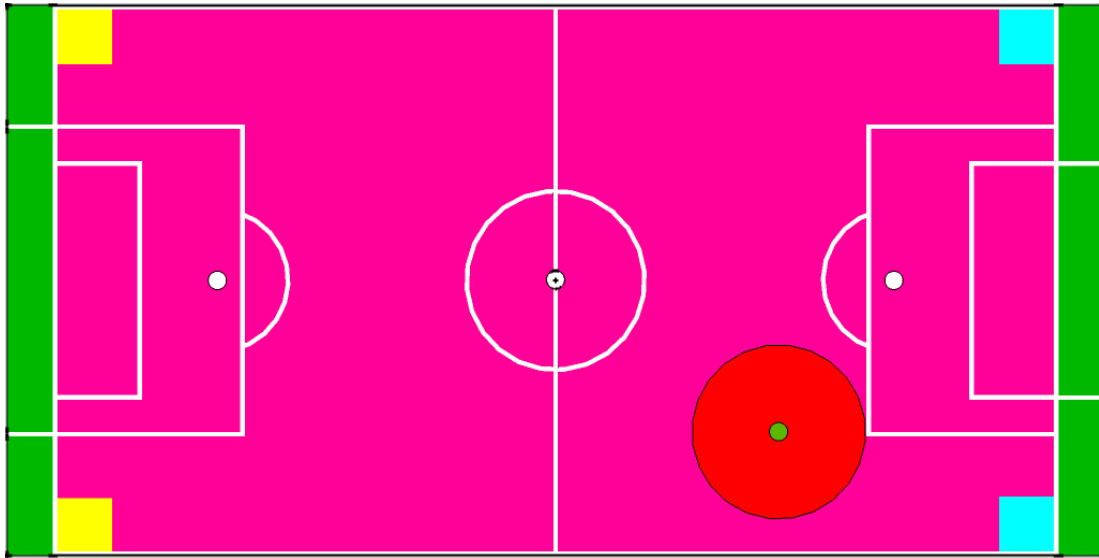


Figure 11 Free kick (example, ball on bottom right free-ball point, red team is attacking)

(Attacking robots can be anywhere in the field and defending robots must be in Magenta region, while withdrawn attacking robots reenter from Yellow region and withdrawn defending robots reenter from Cyan region).

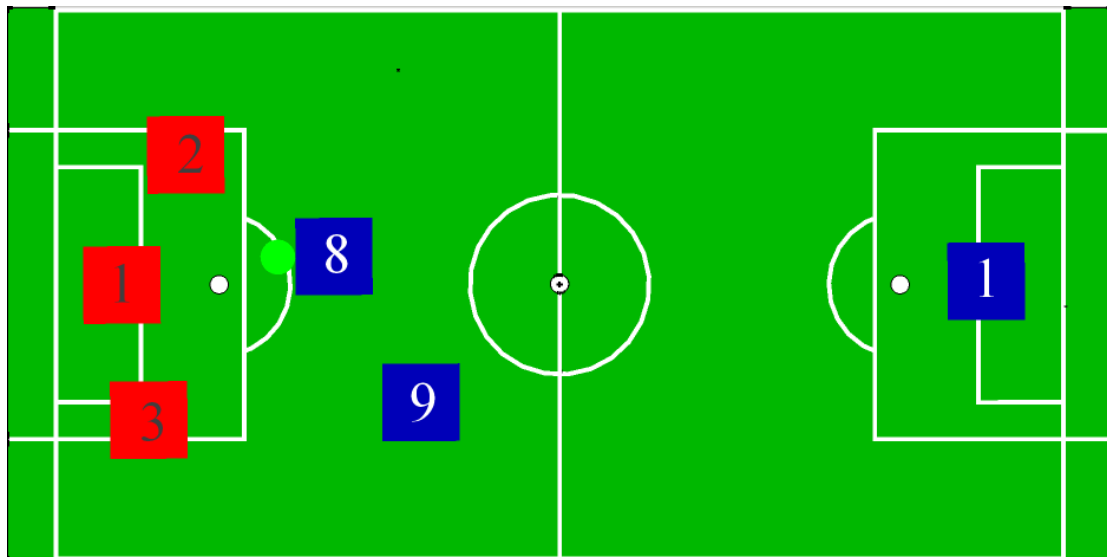


Figure 12 Foul 4.5.3.a (example)

(Foul is called to red team because there are three defenders in the penalty area).



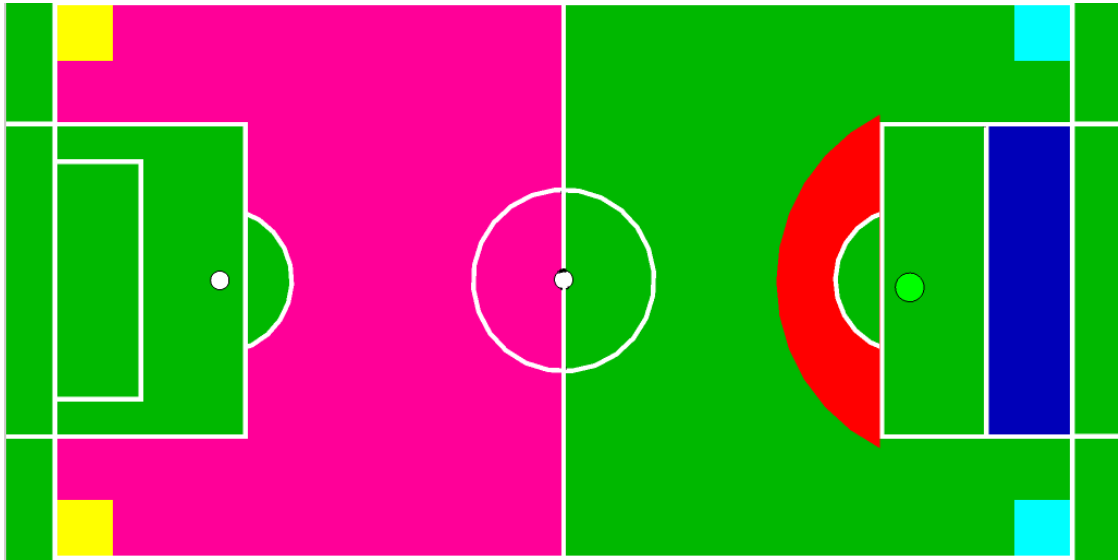


Figure 13 Penalty-Kick (example, red team is attacking)

(One attacking tobot can be in Red region, the goalkeeper of defending team must stop in blue region and other robots in Magenta area, while withdrawn goalkeeper of defending team reenters from Cyan region and all other withdrawn robots reenter from corner area.)

#### 4.5.3 Penalty-kick

- A penalty-kick is awarded to the opponent team if Three (3) robots of defending team are in penalty area of defending team, as in Figure 13.
- When a penalty-kick is called, the ball will be placed at the penalty-kick point (PK) of fouled team manually by the referee. One robot of awarded team can be on but not over the arc of penalty area of defending team. The goalkeeper of defending team must be on the goal line of defending goal. All other robots must stop in another half, as in Figure 13.

#### 4.6 Winning

##### 4.6.1 The Winner

- A goal shall be scored when the whole of the ball passes over the goal line.
- The winner of a game shall be decided on the number of goals scored.
- In each group round robin game, the winner gets 3 points and the loser gets 0 point. Both teams get 1 point if there is a draw. Table 1 is an example of the result in a round robin group, and Table 2 is an example of summary and ranking of the group.
- After games of a group round robin, the teams of a group are ranked based on the criteria in Table 2 from right to left in decreasing priority.



**Table 1. Result of a round robin group (Example)**

Group A	A1	A2	A3	A4
Team A1	-	Lost, 2-3	Won, 4-2	Draw,1-1
Team A2	Won, 3-2	-	Lost, 1-3	Won,2-0
Team A3	Lost, 2-4	Won, 3-1	-	Draw,0-0
Team A4	Draw,1-1	Lost, 0-2	Draw,0-0	-

**Table 1. Summary and ranking of a round robin group (Example)**

Group A	Played	Won	Draw	Lost	Goal For	Goal Against	Goal Difference	Round Robin point	Rank
Team A1	3	1	1	1	7	6	+1	4	2
Team A2	3	2	0	0	6	5	+1	6	1
Team A3	3	1	1	1	5	5	0	4	3
Team A4	3	0	2	0	1	3	-2	2	4

#### 4.6.2 The Tiebreaker

- a. If the tournament rules call for a tie breaker, it should be resolved as follows: In the event of a tie
- b. If the tie persists even after the extra game time, the winner shall be decided through golden-kick.
- c. In each round of golden-kick, each team plays one golden-kick alternately, which are carried out as penalty-kick in Rule 4.5.3.b but with some differences as
  - 1) Only one (1) robot from attacking team and the goalkeeper from defending team are in the field.
  - 2) The player and robot as attacker must be changed in each round of golden-kick.
  - 3) The golden-kick is over if
    - i. The ball passes the goal line.
    - ii. Five (5) seconds are over.
- d. The winner is the team whose robot scores in the golden-kick, while the opponent team does not score.
- e. If both teams scored or no team scores, another round of golden-kick will be run.
- f. In case of a tie even after five (5) rounds of golden-kick, the winner is decided by tossing a coin.



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### 5. ADDITIONAL RULE

- a. The committee has the total rights to add or amend the rules.
- b. Once the rule are announced, no objection will be taken.
- c. Requirement item for robot can see in figure14 and 15 below.

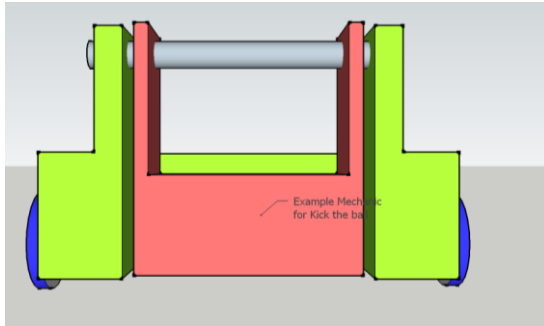


Figure 14 Robot view 1

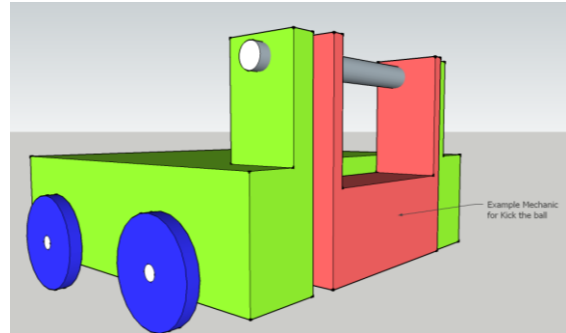


Figure 15 Robot View 2

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