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A.I. Soccer

Participation

1~3

League

Junior/
Challenge

1. Game description

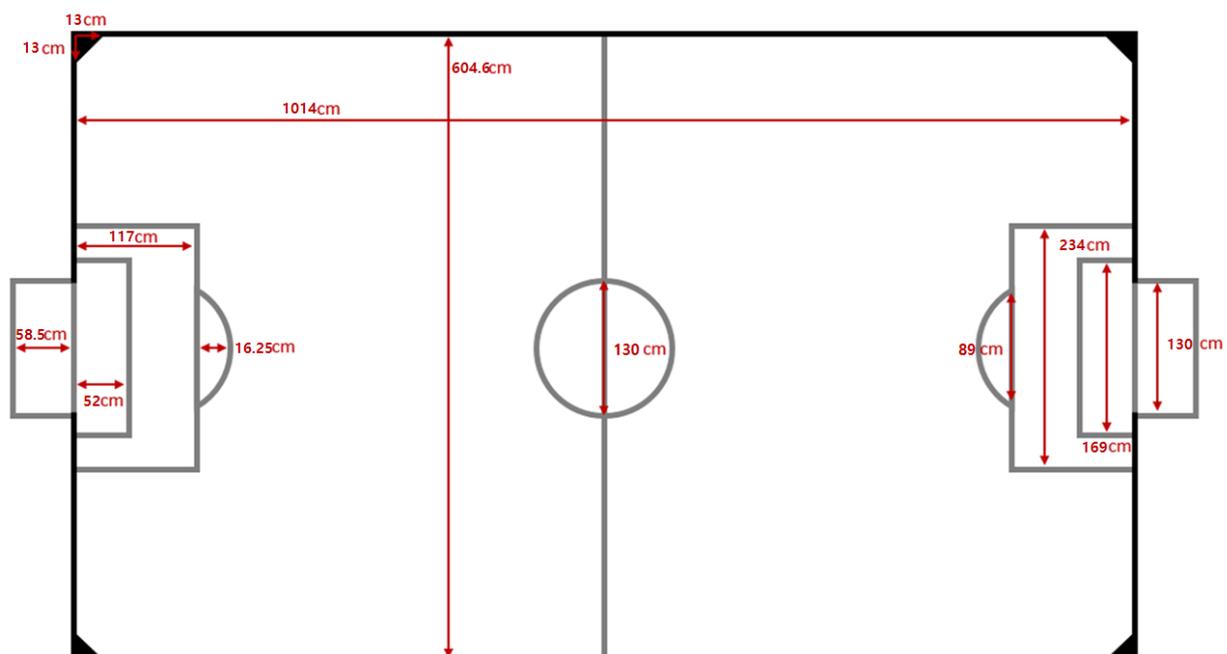
AI soccer is an E-SPORTS soccer game in which participating teams program team strategies and tactics using AI technology. After coding, strategic algorithm implementation is required because it is controlled by a program without human intervention.

2. Platform

2-1. Platform Online platform will be operated for participants and the game will be broadcasted live via IROC channel on YouTube.

3. Competition Site

3-1. Size and Composition Size of the playfield will be 1014cm x 604.6cm (error $\pm 10\%$).

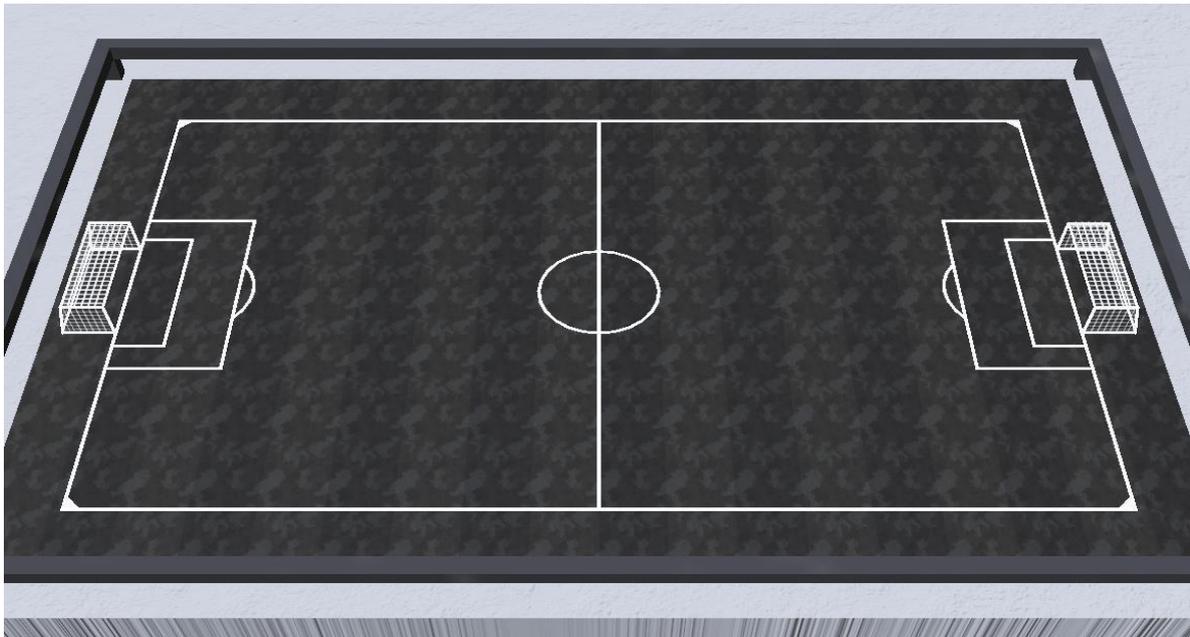


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3-2. Competition field Pitch will be a **dark gray stadium**, and there may be an advertisements or logo of the hosts on the field.

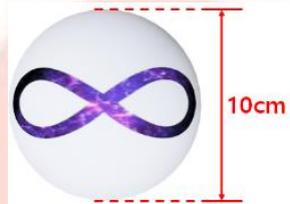


<Actual Screen>

3-3. Playfield adjuncts

3-3-1. Soccer ball Weight 18.4g, Diameter of 10cm.

EX



<Example>

3-3-2. Soccer player

3-3-2-1. Role of robot Basic format consists of 3 roles (GK, Defender, Forward), but the users can play freely regardless of their role.



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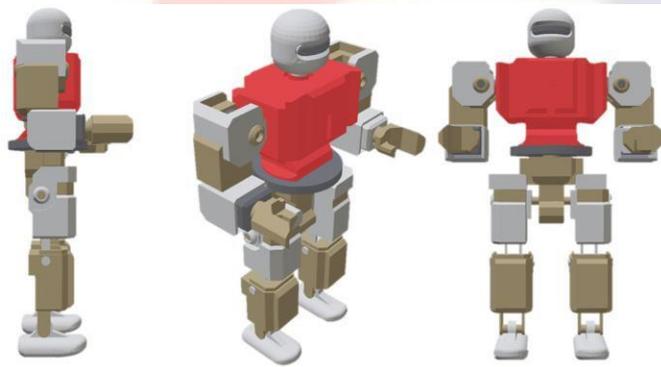
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	Goal Keeper	Defender (D1, D2)	Forward (F1, F2)
Role of Team A	GK	D1 D2	F1 F2
Role of Team B	GK	D1 D2	F1 F2

<Role>

3-3-2-2. Shape of robot Shape of the robot is shown below. Players can choose a player to organize a play.



<Robot shape (Adult)>

3-3-2-3. Specifications 5 robots in a team share the same coordinate system. Some specifications may vary based on the roles as followings.

Role \ Specifications	Goal Keeper (0)	Defender (1, 2)	Forward (3, 4)
Weight of robot	2.5 kg	2.0 kg	1.5 kg
Gravity center of robot	1.5 cm above the ground		
Weight of wheel	0.15 kg each		
Weight of slider	0.5kg each		
Maximum speed	1.8 m/s	2.1 m/s	2.55 m/s
Maximum rotating torque	0.8 N*m	1.2 N*m	0.4 N*m

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<Physical law specification>

4. Game process

4-1. Process

4-1-1. Game time First half 2.5 minutes, second half 2.5 minutes.

4-1-2. Position Team A: Left field, red robot / Team B: Right field, blue robot

4-2. Code Development Maximum of 6 hours will be given to develop code. Code must be made within the given time period. Basic code will be given from the administrator at every competition.

4-2-1. Laptop to develop the code The laptop to develop the code must be prepared by the participant.

4-2-2. There must be no codes in the laptop before starting the competition. If the competition has a code prepared in advance, or uses it, the participant may be considered fraudulent, and be warned or disqualified.

4-3. Submission Please be aware that the submission way may differ depending on whether played face-to-face or non-face-to-face.

Store the files on a USB memory stick and hand it in to the administrator at the site, and the participant must check whether it works on the administrator's simulator.

4-3-1. Folder name python: team name_teammate1_teammate2 (must be written in English)

4-3-2. Problems on the submitted code When the simulation is impossible on the host's simulator due to the problems on the code, the participating team may be disqualified.

5. Game

5-1. Mission The team that scores more during the first/second time wins.

5-1-1. Stalemate If all robots in both teams can't kick the ball properly.

There may be a situation that AI-based robots can't kick the soccer balls properly. Unlike the actual stadium, the stadium of AI football is surrounded by a hard wall. Thus, the robots can push the ball to the wall, and if several robots do the same action, the ball may fall in a stalemate that the ball does not move.

It is considered stalemate if the ball moves under 0.4m/s for four seconds. It will be handled differently based on the region stalemate occurred.

5-1-2. Field decision Participants will choose the field (red team, blue team) by playing games such as rock-paper-scissors, drawing lots, and throwing coins.

5-2. Acquiring points 1point per goal will be given each time player puts a goal into the opponent's goal post.

5-3. Game rule

5-3-1. Kick off The competition will be carried out with the kick-off of the red team after the

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starting signal. After the first half, the second half will be carried out by the kick-off of the blue team. After scoring, the game will be played with a kick off the team that lost points.

* Robots other than forward(F2) of the team with the ball possession move when the ball falls out of the center circle or when the ball does not fall out from the center circle for 3 seconds.



5-3-2. Ball Out This refers to the situation in which the ball goes out of the sideline.

The game will be carried out with a goal kick or corner kick.

A team with a smaller number of robots that kicked before the ball out will take the possession of the ball. (Cases that more than two robots kick may exist.)

If numbers of robots are the same, the team in the direction where the ball went out takes the possession.

5-3-3. Corner kick If stalemate occurs in a corner area or if ball goes out of the field, the game will be continued as a corner kick. Depending on the location of the corner where the corner kick is taking place and the team that owns the ball, type of the corner kick will be processed.

Robots other than forward(F2) from the team with the ball possession move when the forward(F2) of the team with ball possession kicks the ball or when the robot fails to kick the ball for three seconds.



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5-3-4. Penalty kick If stalemate occurs in a penalty area or at a foul situation, the game will be continued with a penalty kick. Robots other than forward(F2) from the team with ball possession move when the forward(F2) of the team with ball possession kicks the ball or when the robot fails to kick the ball for three seconds.



5-3-5. Goal kick If stalemate occurs in a penalty area or in a foul situation, the game will be continued with goal kick. Robots other than forward(F2) from the team with ball possession move when the goal-keeper(GK) of the team with ball possession kicks the ball or when the robot fails to kick the ball for three seconds.

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5-3-6. Red card If robot turns upside down for 3 seconds, they will be sent outside the playground, then return to the basic position (kick-off position) after 5 seconds. Exceptional situations: If there is another robot or ball in the position they must return, they must go back again after the obstacle moves.



5-3-7. Ball relocation Ball will be relocated if stalemate occurs at a region except corner and penalty area (red square). Ball will be relocated to the position closest to current position among the four designated positions (red points). The position doesn't get reassigned.

5-3-8. Follow AI Soccer Manual for the things not mentioned above.



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6. Evaluation

6-1. Evaluation Will be evaluated according to scored points.

6-2. Extra time golden ball If tied after first and second half, extra time will be given and the player who scores first wins.



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