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A.I. Soccer

Participation
1~3

League
Junior/Challenge

1. Game Description

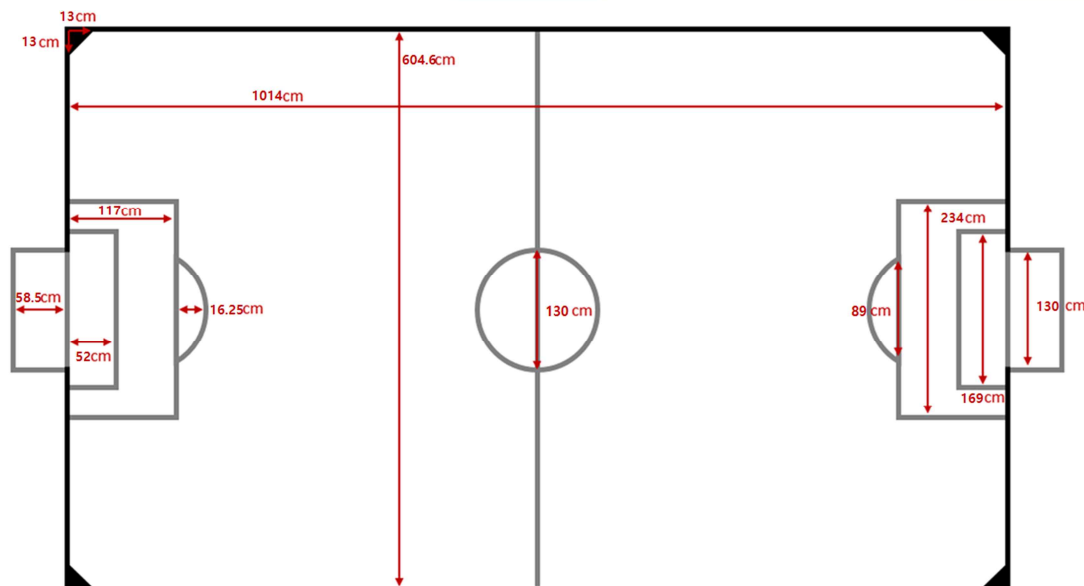
AI soccer is an E-SPORTS soccer game in which participating teams program team strategies and tactics using AI technology. After coding, strategic algorithm implementation is required because it is a game controlled by a program without human intervention. **This game is conducted face-to-face or non-face-to-face.**

2. Platform

2-1. Platform Participants will get to play in the stadium in online platform. Will be broadcasted in the Youtube (IROC channel) lively.

3. Competition Site

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

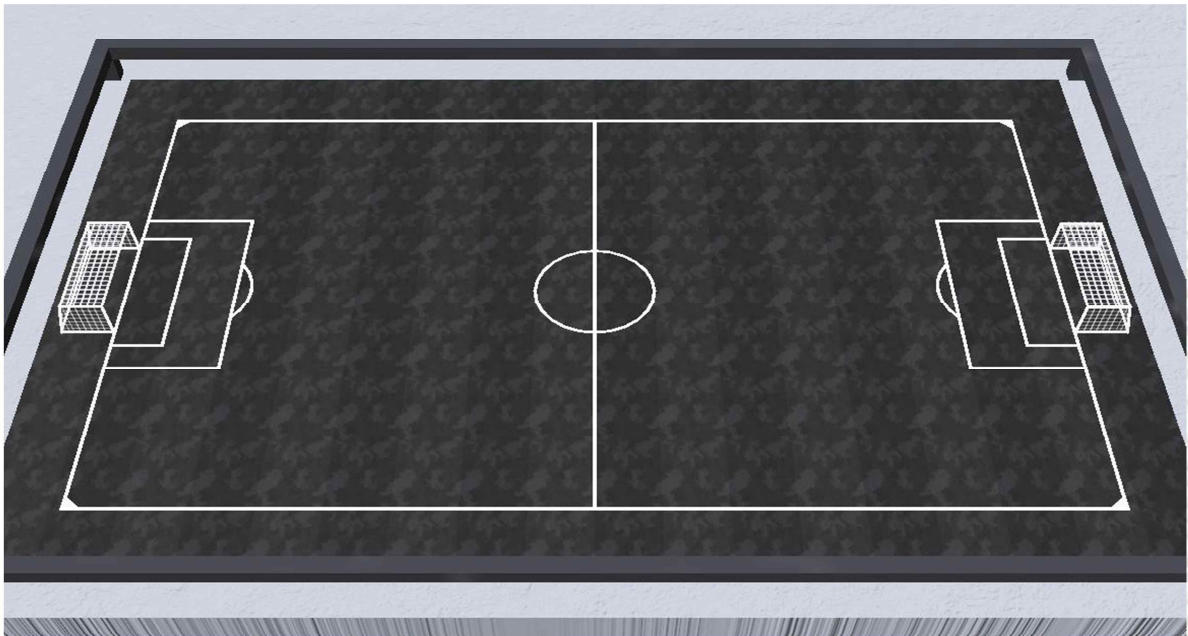


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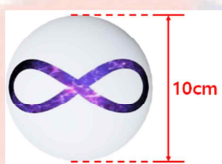
3-3. Pitch Pitch will be colored dark gray. Advertising of logos, etc. may be included.



<Actual Screen>

3-4. Composition

3-4-1. Soccer ball Weight 18.4g, Diameter of 10cm.



<Example>

3-4-2. Soccer player

3-4-2-1. Role of robot Basic role consists of **3 roles (GK, Defender and Forward)**, But, users can play freely regardless of role.

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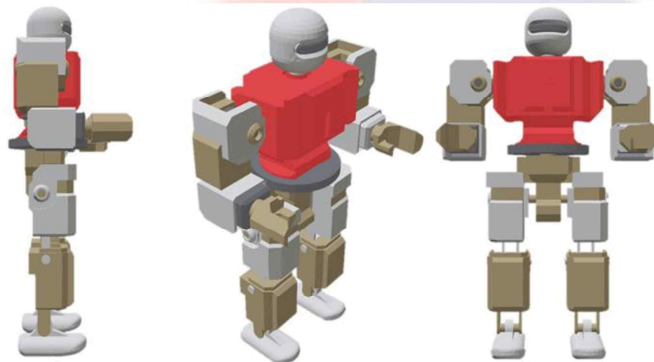
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	골키퍼 (GK)	수비수 (D1, D2)	공격수 (F1, F2)
A 팀 역할 표시	GK	D1 D2	F1 F2
B 팀 역할 표시	GK	D1 D2	F1 F2

<Role>

3-4-2-2. Shape of robot Shape is shown below, users can choose player and configure play.



<Robot shape<Adult>>

3-4-2-3. Specification 5 robots in one team share same coordinates. Some specifications may vary according to the specification.

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Role	GK (0)	D (1, 2)	F (3, 4)
Specification			
Robot weight	2.5 kg	2.0 kg	1.5 kg
Robot center gravity	Ground 1.5 cm		
Wheel weight	Each 0.15 kg		
Slider weight	Each 0.5kg		
Maximum speed	1.8 m/s	2.1 m/s	2.55 m/s
Maximum rotary torque	0.8 N*m	1.2 N*m	0.4 N*m

<Physical law specification>

4. Game Process

4-1. Process

4-1-1 Game time First half 2.5 minutes, modification time 5 minutes, Second half 2.5 minutes.

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

4-2. Tournament The game is played as a tournament. If process is non-face-to-face, 1st game is played as a league, 2nd game is played as a tournament

4-3. Mission Mission will be given to the competitors to modify the necessary algorithms before the start of the competition. (Dribble, Shooting, etc.). if process is non-face-to-face, there is no mission.

4-4. Modification time After the end of the first half, the algorithm of the submitted code can be modified and submitted for five minutes before starting the second half (if no modification is required, can proceed immediately). if process is non-face-to-face, the modification time is not given.

4-4-1. Submission Submission is organized differently depending on face-to-face or non-face progress

Face-to-face: Store files on removable disks (USB, removable HSS/SSD, etc.) and present it to the HQ

Non-face-to-face : Each Team will submit to organizer's e-mail. Submit time will be upload on website

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Organizer's e-mail address : support@iroc.org
4-4-2. Extension python : .py

5. Game

5-1. Mission During first/second time, score more goals than opponent.

5-1-1. Stalemate If all robots in both teams can kick the ball properly.

AI-based robots can't hit soccer balls properly. Unlike the actual stadium, the stadium of AI football is surrounded by a hard wall, so robots can push the ball to the wall, and if several robots do the same, the ball can be stopped.

Recognized as a stalemate that the ball is moving for four seconds at less than 0.4 m/s

Will be handled differently depending on the region where both are locked in the stalemate.

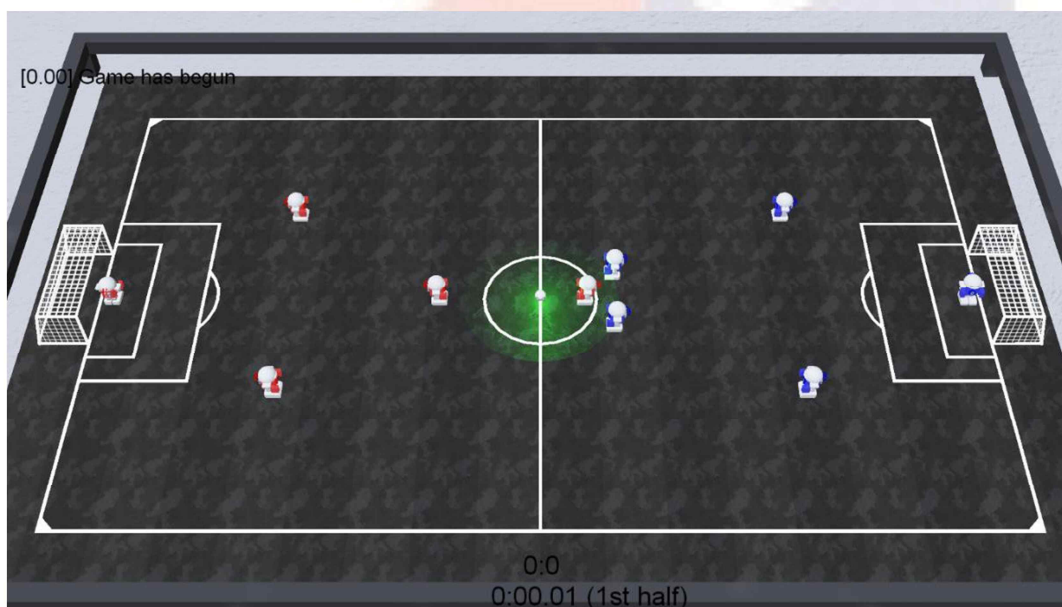
5-1-2. Field decision Participants will have a choice after playing rock-paper-scissors, drawing lots, and throwing coins will choose the camp (Red Team, Blue Team).

5-2. Score Each time players put a ball into the opponent's goal post, earn points (1 point per 1 goal).

5-3. Game rule

5-3-1. Kick off The competition will be carried out with the red team kick-off according to the start signal. After the first half, the second half will be played by the Blue Team Kick-off. After scoring, the game will be played with a team kickoff that has lost points.

* Robots other than Forward(F2) in teams with ball possession move when: (If the ball is out of the center circle / the ball is not out of the center circle for 3 seconds)



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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 small number of robots that last kicked the ball before it went out will take possession of the ball. (Cases when more than two robots are kicking the ball-Stalemate)

If number of robots is same, possession will be decided by ball out direction.

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

Robots other than Forward(F2) in teams with ball possession move when.

(If the ball possession team forward (F2) kicks the ball/ If fail to take the ball for three seconds.)



5-3-4. Penalty kick If stalemate occurs in penalty area or in foul situation, Game will continue with penalty kick.

Robots other than Forward(F2) in teams with ball possession move when.

(If the ball possession team forward (F2) kicks the ball/ If fail to take the ball for three seconds.)

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5-3-5. Goal kick If stalemate occurs in penalty area or in foul situation, Game will continue with goal kick.

Robots other than Forward(F2) in teams with ball possession move when.

(If the ball possession team forward (GK) kicks the ball/ If fail to take the ball for three seconds.)



5-3-6. Red card If robot turns upside down for 3 seconds. Will be sent off the playfield.

Will return to the basic position after 5 seconds.

Exceptional situation: If there is another robot or ball in the position to return, return after the object is gone.

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5-3-7. Ball relocation Ball will be relocated place if stalemate occurs (except corner and penalty area). Ball will be relocated to the position closest to the 4 specified positions. (Red points)

5. Game Result

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

6-2. Extra time Golden ball If the scores are the same after the entire game, the first player to score will win.

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