
Sony Quadruped Robot Football League Rule Book

(Draft on 6/14/1998)

Rules are classified into several categories

1. Setup of the environment
2. Robot Players
3. Game process
4. Forbidden action of robots and penalties
5. Judgement

1. Setup of the environment

1-1. Field Size

Dimension of Football field is described in Figure 1-1(Field Size).



Figure 1-1 (Field Size)

1-2. Field Color

Color of Football field is shown in Figure 1-2(Field Color). Additionally, please refer to Reference Materials titled under "Colors used in the Football Field". And also you can refer to "Robot View" in RoboCup-98 Paris on the web with regard to the color samples a robot captured.



Figure 1-2 (Field Color)

1-3. The results of spectrum

The results of spectrum of the color samples measured is on the web. Please refer to Reference Materials titled under "Spectrum of the color samples". Regarding lighting condition in the actual site, we have checked it at the FORUM, La Cite des Sciences.

As a result, we have now two options;

1. Set the color temperature as same as that of daylight. (5500 K)
2. Set the color temperature as same as the normal fluorescent lamp. (4300 K)

We will let you know our decision soon.

A sample image of an orange ball with 10cm in diameter used in the competition is on the web.

1-4. The Lighting Condition

The Lighting Condition on the field will be

1. The illuminance : 1000--1500 lx
2. The color temperature: 5600 K.

2. Robot Players

Please refer to a brief introduction of Sony Quadruped Robot described in a separate file.

2-1. Teams

One team should consist of 3 robots including a goal keeper.

2-2. Goal Keeper

Goal keeper is the only player who is allowed to stay within penalty area of its own team.

2-3. Size and Shape

It is described in a separate file as well.

2-4. Body color

In actual competition, a robot will be covered with solid plastic painted in black. In order to distinguish one team from the other team. Each team should prepare to wear cloth in either red or blue on the head and body. The team color should be changed in each break and may change in each game. The color of other parts of body (ex : the legs) is basically black. But it doesn't mean your robot is completely black, for example you can't paint the lens to be black.

Try to hide colored parts as possible, especially the colors listed in "1-2 Field Color". For the lighting of LED, we will leave it up to you whether to keep it ON or OFF during the game.

2-5. Ball handling mechanism

Refer to "4-1. Ball Holding".

2-6. Communications

There are no restrictions on communication between the robots using a microphone or a speaker.

Wireless LAN used in the start/stop signal sending can not be used for communication between robots.

In case of using wireless LAN, the wireless communication shall follow legal regulations of the country where the tournament is held.

Robot must execute decision and action on its onboard computer.

The use of remote computer is prohibited.

2-7. Global Vision System

Global vision system is prohibited.

2-8. Sensing System

Any other sensors than originally installed to the current robots are not allowed.

3. Game process

3-1. Length of the game

One game consist of three parts, the first half, break and the second half.

Each half is 10 minutes. The break is also 10 minutes.

In case of a draw game, there will be an extension game to play which consists of two parts, first half and second half.

Each half is 5 minutes and there is no break in between. When the game is still a draw, then there will be a penalty kick with 3 robots vs 3 robots and sudden death will be employed.

Please note that we tentatively decided length of the game, but we will see in the preliminary match scheduled on July 2 and 3 in Paris how this will go and then decide.

The referee can adjust (extend/shorten) this period depending on the situation.

A court change and uniform change will occur in the break.

3-2. Winner

The team marked more goals than the other is a winner of the match. If two teams marked same score, the game will be a draw. The draw will follow the same system defined right above 3-1 starting from an extension game of 5-minute half.

Total (and final) standings will be decided on points as follows;

(the points will be given based on the result of each game)

WIN = 3 pts. LOSS = 0 pts.(as long as the game ends including the extension game period)

WIN = 2 pts. LOSS = 1 pts. (for the penalty kick)

A schedule of the league match are on the web. (Please refer to "Information " in RoboCup-98 Paris on the web.)

3-3. Start-up

A game (or a robot) will be started in one of following two methods.

- command from wireless LAN (wireless LAN can only be used for start/stop signal.)
- manual switching

Sooner or later, we will decide which one will be used.

3-4. Kick-off/Restart/Stop

For kick-off, restart, and stop of the game, the referee will call verbally, or by whistle, and the operator of the team can send signals by wireless LAN to robots or relocate by his/her own hands.

3-5. Robot positions at kick-off/Restart

3-5-1. Kick-off

All robots shall be located in their side of the field. Only one robot, which kicks the ball, shall be in the center circle.

The restart after the goal shall adopt the same formation as the kick-off.

3-5-2. Free Kick

None.

3-5-3. Penalty Kick

Penalty kick is defined as one-on-one confrontation between the goal keeper of the defending team and a player chosen by the opposition as its kicker. All other robot players must remain outside the penalty area.

The kicker will kick the ball from the middle between the goal line and half-way line and the change to the software program which is especially designed for Penalty Kick will not be allowed. You can put the goal keeper wherever and however you like, but the keeper is not allowed to move. In other words, the power switch should be OFF during the penalty kick.

The game will be restarted in a same way as kick-off regardless of making goal.
The ball will be given to the goal keeper's team if the goal was made, otherwise to the kicker's team.

3-5-4. Throw-in

None.

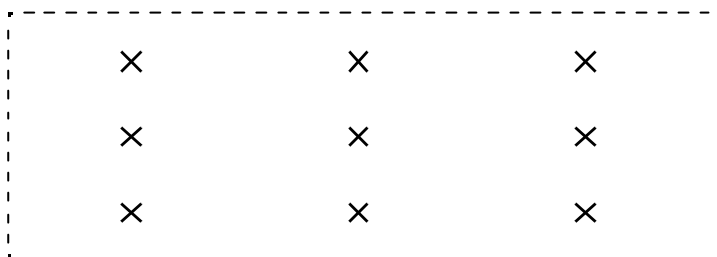
3-6. Forbidden actions

Forbidden actions are defined in the section ""4. Forbidden action of robots and penalties"".

3-7. Game stuck

In the event of no substantial change in the game state(as shown in "Figure 1-3(Stuck)") for 10 seconds (eg. ball stuck in the corner), the referee shall replace the ball at the nearest "ball placement point" on the field.

The referee shall pick up and replace them apart in a proper direction if two or more robots are stuck with each other without a ball or against the side field.



Note : perhaps these should be marked with small white dots on the field.

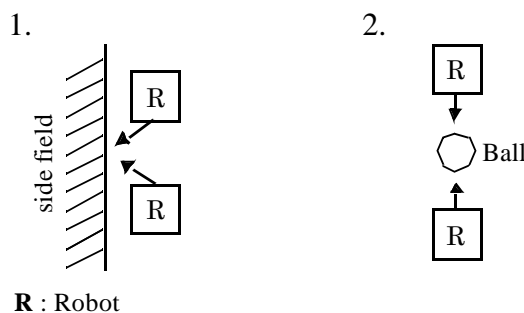


Figure 1-3(Stuck)

4. Forbidden action of robots and penalties

Following actions are forbidden.

4-1. Ball Holding

Holding a ball means taking a full control of the ball by removing its entire degrees of freedom; typically, fixing a ball to the body or surrounding a ball using the body to prevent accesses by others.

It is important that another robot can easily take possession of the ball when a robot controls the ball.

Refer also "2-5. Ball handling mechanism".

This action will result in having the robot which held a ball outside of the field for 10 seconds and it should be back to the field from half-way line 10 seconds later.

4-2. Damage to the field/robots/ball

A robot that damages the field and/or other robots will be removed from the field for the remainder of the game.

Similarly a robot that poses a threat to spectator safety.

In such a case, penalty kick will be employed.

4-3. Prohibited Defence

For defence, only one robot can stay in the penalty area as a keeper.

The robot who commits this action will be ordered to be outside of the field for 0 seconds, namely he will be replaced and returned from half-way line 0 second later.

4-4. Charging - In the vicinity of the ball (eg. within 50cm)

A robot may make contact with an opposing robot only in the process of trying to get the ball.(as shown in "Figure 1-4(Charging)")

But deliberate and repeated violations such as attacking the opposing robot too hard or unnecessary collision will result in clear possession of the ball being awarded to the opposing team.

The victim robot can be helped get back to the way it was before and the attacker robot will be ordered to be outside of the field for 30 seconds. The latter one should be back to the field from half-way line 30 seconds later.

A referee will judge every case.

In case of charging which results in damaging other robot, P.K will be employed.

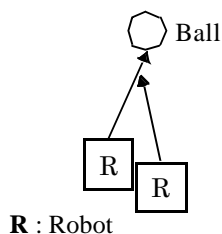


Figure 1-4(Charging)

4-5. Obstruction (away from the ball)

The definition of obstruction is that one robot who is not heading for the ball gets in the way of another robot who is in the process of heading for it.(as shown in "Figure 1-5(Obstruction)")

The robot who commits this action will be ordered to be outside of the field for 0 seconds, namely he will be replaced and returned from half-way line 0 second later.

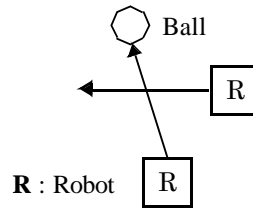


Figure 1-5(Obstruction)

4-6. Jamming

During the match any robot shall never jam communication and sensor system of opponents. The usage of equipments which may cause interference of communication or sensors should be negotiated between two teams before the match.

5. Judgement

5-1. Selection of the referee

Sony staff

5-2. Referees during the match

Referees are provided from D21 Laboratory..

We established where you can contact for any questions regarding the Rule.
Here is the e-mail address for that : openr-robocup@pdp.crl.sony.co.jp

Last modified: THU June 4, 1998