Robot Soccer League:

Game Laws of Humanoid Robot Competition for Soccer

Abstract:

A humanoid robot is an extremely complicated system to hardly go on the way for full autonomous function. Therefore, this competition on robot soccer paves on the middle way of full autonomous humanoid robots development via remote control and tele-operation control. Right now the competition event is penalty kick (PK). The humanoid robot of each team owns five balls, respectively. Five balls are kicked for their goal mouths to get different points that are dependent on their locations. The humanoid robots of both teams play simultaneously in a fixed time. The humanoid robot getting more points wins the competition.

In the future, the competition will add other events such as both humanoid robots playing the same five balls, the play field puts some obstacles, etc. In addition to boosting the capabilities of humanoid, the competition aim at the final objective, full autonomous.

1. Humanoid Specifications

1.1 The humanoid must walk by two legs. The robot walking doesn’t allow making use of link, wheel or the other mechanism that is not biped. The definition of humanoid robot is identified by referees in the previous of competition start.

1.2 The humanoid robot must take the battery for its power source.

1.3 The humanoid must kick the ball via legs. Kicking device and extra power for kicking are not allowed.

1.4 The tall and weight of humanoid must below 35 cm and 2kg (don’t include
remote controller), respectively.

1.5 Extending both legs of humanoid robot cannot over 50cm, and the size of foot is below 7cm*12cm.

1.6 Extending both hands of humanoid cannot over 50cm.

1.7 The humanoid robot is controlled by a remote controller. Antenna is a part of the humanoid. Thus the size of the humanoid counting must include antenna.

1.8 The participants must prepare two radio modules in different frequencies. The duty of frequency disturbance is the participants.

2. Play Field
The play field is FIRA AndroSot as shown in Fig. 1.

![Fig. 1. The play field.](image)

3. Competition Rules

3.1 The competition separates into two events: remote control and tele-operation control. In the remote control event, the operator can watch the humanoid for control. In the tele-operation control event, the operator only watches the competition situation via the camera on the humanoid. Therefore, the
humanoid robot in the tele-operation control event must prepare a camera to capture the image and to send to a laptop for participant operation. In addition, after competition start, the humanoid robot must be bale to walk to color region. After that, the participant allows starting to control the humanoid robot.

3.2 The humanoid robot must pass the evaluation. The humanoid robot that fails the evaluation doesn’t allow joining the competition. After the evaluation, the humanoid robot doesn’t allow changing.

3.3 During the competition, only one team member can operate the humanoid robot. And the team member must be far away the robot over 50cm.

3.4 In every game, each team has five ball to play in 3 minutes.

3.5 The organizer provides the balls. The balls can be tennis or golf balls.

3.6 Participants must put the balls at the assigned location. Referee has the right to put the ball at the assigned location.

3.7 Participants must put the humanoid robot at the assigned location.

3.8 After the participants start operating the humanoid robot, it is identified as kick the ball if the ball moves out the assigned location.

3.9 The ball over the goal mouth lines half of its size is identified as getting point.

3.10 The ball being far away the mouth 60 is number 1 that owns 1 point if it goes into the mouth. The ball being far away between 60cm and 30 cm is number 2 that owns 2 points if it goes into the mouth. The ball being far away between 45cm and 30cm is number 3 that owns 3 points if it goes into the mouth.

3.11 The participants who cannot get any point are cancelled the competition.

3.12 If the teams get the same point, the competition goes into tie break. The tie break is not over three games. If getting 0 point after 3 games, both teams are cancelled the competition.

3.13 Every game of the tie break has 30 seconds. The team who first kicks the ball far away the mouth 60cm win the competition.

3.14 During the tie break, the referee has the right to assign the ball location.

3.15 After the semi final, the humanoid robots don’t allow adjusting.

3.16 The referees own all of the right for the competition. Participants must
follow the referee judge.