

The Next Big Thing: More Set Pieces in the SPL

B-Human's Contribution to the Standard Platform League Open Challenge 2013

I. MOTIVATION

We see the Open Challenge as a forum for presenting work that pushes our league forward. We did so in 2011, when we introduced playing with two yellow goals, which made it into the rules of the following year, and in 2012, when we introduced a new GameController, which is also used this year. After the recent rule changes (yellow goals, bigger field, more players) the question is what the major change for RoboCup 2014 will be. We observed that in contrast to other RoboCup leagues such as the Small Size League, the rules of the Standard Platform League only contain a single set piece: the kick-off. However, set pieces such as throw-in, free kick, in-game penalty kick, and corner kick play an important role in human soccer. Therefore, we think it is time to introduce more set pieces into regular SPL games on our road towards the 2050 goal. As an interesting candidate, we identified the corner kick, because it will not happen too often during a game and therefore does not disturb the flow of a game too much if not done well, but there is enough to gain or to lose for both teams for them to invest in implementing an interesting attack or defense for this set piece.

II. THE RULES

When a robot kicks a ball out over the own ground line, the opponent team is granted a corner kick. The ball will then be placed on the left or right field corner depending on which side of the goal the ball was kicked out. Both teams have 30 seconds to take their positions.

The defending team is allowed to build up a defensive wall while keeping a distance of at least 1.5 m to the ball. One robot of the attacking team takes position to kick the ball in. The other robots of the attacking team also need to keep the same distance as it is depicted in Fig. 1.

Once the positioning time is up a “set state” follows. If robots are standing too close to the ball, they are removed from the game for 30 seconds. Afterwards the game state is changed to playing. No robot is allowed to approach the ball until it has been moved by the kicking robot or 10 seconds have passed, whichever happens first.

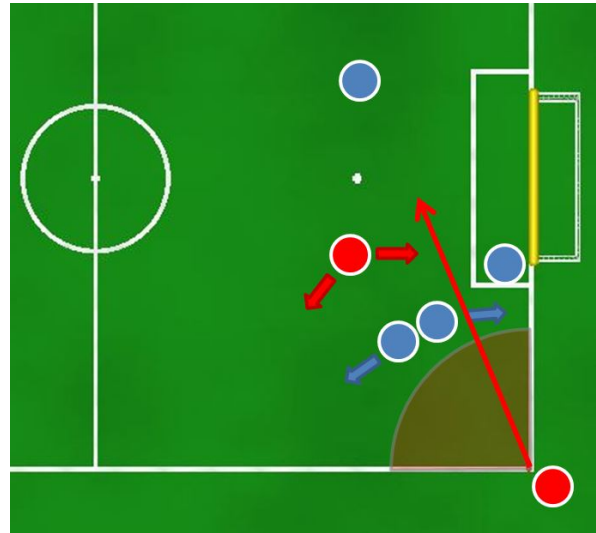


Fig. 1. Corner kick situation: The red team executes the kick while the blue team defends the goal.

III. OUR PRESENTATION

Our Open Challenge contribution is the implementation of the corner kick set piece, in which both teams behave according to the rules described above and react to the positioning of the other team by tracking the positions of their players. It involves six robots – two attackers and four defenders.

A. Defending Team

The defending team consists of four players. Two of them will build a defensive wall, trying their best to mark up the ball-taking attacking player. The goal keeper will protect its goal near the goal post. Since all three players will look at the ball, a fourth player observes the robots of the attacking team that are ready to receive the ball (in case of our demonstration, only one), and communicates this knowledge to its teammates in the wall, so that they can try to mark up that player.

B. Attacking Team

The team that executes the corner kick consists of two robots. One of them moves on the field, trying to take a good position to receive the ball, the other one will actually kick the ball in if there is no opponent robot between it and its teammate or the time is up.