Sorry, No Humans Allowed
Robots Refereeing Robots

B-Human's Contribution to the Standard Platform League Open Challenge 2014

I. Motivation

In all RoboCup soccer leagues that use real robots, refereeing is still performed by humans. However, some of the situations that referees have to decide upon are at least partially already detected by the players themselves. For instance, B-Human's robots estimate, where the ball has to reenter the field after it was kicked out, and they also know when the ball is free after a kick-off. Therefore it makes sense to think about which situations could be detected by robots and to start implementing robot referees.

II. Positional Play of Referee

The way how a robot referee walks over the field is based on a human referee in a real soccer match. In general, a game has a head referee and two assistants. Their positions and walking paths are displayed in Fig. 1. The two assistants are located on different field sides (red circles in the picture). The referee walks on a smooth diagonal curve, often called "lazy S", depending on the current ball position. Therefore, all relevant events are always located between it and one of the assistants and all situations can be seen from two points of view. Thus it is less likely that none of them has seen a relevant situation.

III. Our Presentation

Our Open Challenge contribution is the implementation of a robot head referee and the two assistants. The presentation involves these robots as well as field players of different teams. There will be no communication between the referee robots and the robots playing. The players cause some situations that the referees should identify. Such situations could be an *Illegal Defender* or a *Fallen Robot*, but also a ball kicked out or a goal scored. The head referee robot will announce its decision and, when announcing a penalty, it will point at the position where the infringement happened.

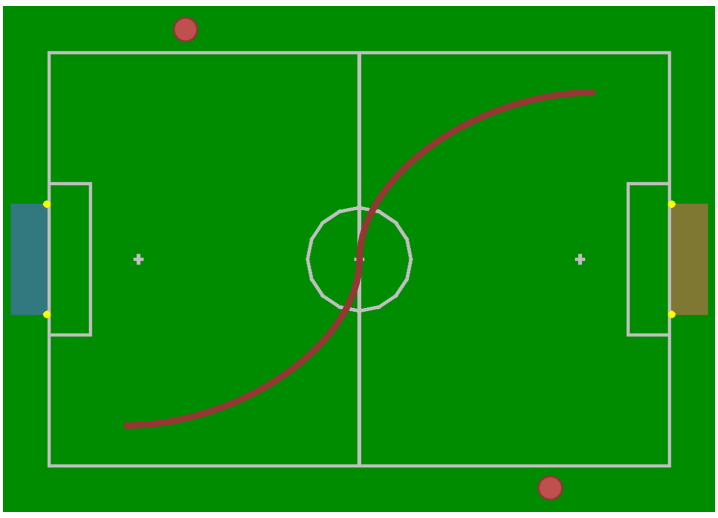

Fig. 1. Referee "lazy S" diagonal run and positions of two assistants