

# SmartRef: Assisting Referees

## RoboCup SPL Open Challenge 2013, Nao Devils Dortmund

### 1 Motivation and Objectives

Refereeing a game in the Standard Platform League (SPL) has become an increasingly demanding job over the past years. Robots are moving faster, there are more tacklings and other actions in the games, and finally the number of robots to constantly observe has increased to five for each team. Moreover, the environment during the games is challenging and imposes additional difficulties and problems on the referees to deal with. In this regard, the size of the SPL field has grown to  $54m^2$ , and the communication between the head and assistant referees is significantly impaired by cheering crowd, and noise from supporting team members.

Team Nao Devils decided to address this problem by developing a smartphone application that will support referees doing their work. The smartphone app is designed to smoothly integrate into the existing RoboCup software infrastructure. Thus, the app is able to listen to the GameController and to react on its commands. Team Nao Devils will present the application for Android smartphones. On a mid-term perspective, it is intended to migrate the software application from the smartphone to smartwatches, and to other RoboCup disciplines.

### 2 Features

The smartphone application SmartRef includes a context-sensitive graphical user interface and offers the following features:

- Different views for each stage of the game.
- Different views for head referees and its assistants.
- Dynamic rule helper, e.g. for manual positioning, throw-in positions.
- Vibration in case of specific events (robots to be penalized, back in).
- Display of various time limits (game times, kick off, all in play).
- Warnings before end of each half-time, the half-time itself, and timeouts.