



Executive summary

Autonomous Referee System

Technology is gradually finding its way into many sports, significantly reducing the number of human mistakes when enforcing the rules. If it was possible that one day machines could completely replace humans in game refereeing, the unpleasant arguments and fights originating from human referee mistakes could be avoided. Eindhoven university of technology aims at developing a system that can monitor a soccer game in real time and make fair autonomous decisions. This project is a step towards this goal.

The goal of our project was to design an autonomous refereeing system for the Robocup middle size league (MSL) with specifically ensuring continuity for future work. Our deliverables were system functional specification, ball-player distance violation checking algorithm prototype, project management plan, wiki page documentation, and a video of the final output.

There were two sub-teams in our project, system architecture and implementation team. System architecture mainly focused on specifying the functions of the autonomous referee for Robocup MSL as derived from the MSL rulebook. In short, this functional specification is a breakdown of MSL rules (or laws) into robot skills through robot tasks: tasks are statements describing what the AutoRef must do to enforce the rules, written in plain language as to fully explain referee actions without describing the means by which to achieve them; skills are fundamental abilities which are needed to accomplish a specific task.

The implementation team has designed, implemented, and tested the "ball-player distance violation checking" task. This task is applicable to six laws from the MSL rulebook. During the project, the following activities have been carried out in the implementation team: requirements engineering, system architecture, algorithm design and implementation, and test and verification. Moreover, project management and creating conclusions and recommendations for future generations have been done in this team. It is necessary to mention that continuity and modularity have been considered in the implementation steps, up to a level that several activities have been carried out for this aim.

Finally, we have documented our work in form of wiki page. If you follow this [link](#) you reach the wiki page.

We have also made a video for our project explanation. You can find it by following this [link](#).