

# ISocRob Coach 2004: Short Description

João Pavão, Carla Penedo, Pedro Nunes, and Luis Custódio

Institute for Systems and Robotics  
Instituto Superior Técnico  
Av. Rovisco Pais, 1 – 1049-001 Lisboa, PORTUGAL

{jpp,ccfp,pngn}@rnl.ist.utl.pt,lmmc@isr.ist.utl.pt

Homepage: <http://socrob.isr.ist.utl.pt/indexSim.php>

**Abstract.** This paper briefly presents the main concepts that describe the ISocRob Coach 2004 agent for the soccer simulation league.

## 1 Introduction

In the field of multi-agent systems, specially in the high demanding real-time environment of soccer simulation, having a good agent modeling tool is of the utmost importance. Gathering higher-level information about the team performance, and about its opponents as well, is normally not a very easy task to be done by the players on their own. Given the pressure put into always communicating in a timely manner (as to never lose a single opportunity of sending actions to the server), the players don't have enough free time to "waste" deliberating on these high-level informations. So, a coach agent without any of the time limits mentioned above is the obvious choice upon which to relay this responsibility.

The ISocRob Coach 2004 agent for the soccer simulation league is part of the ISocRob project, which encompasses a Middle-Size League team of real robots and a Simulation League team. Our coach agent participated in the RoboCup World Cup competition for the first time in 2003, where we also entered in the now extinguished "Game Analysis and Presentation" competition with the RoboCup Advanced 3D Monitor[1]. This monitor is available for download on our homepage and is used side by side with the coach as a debugging aid, as will be explained bellow.

## 2 Game Analysis

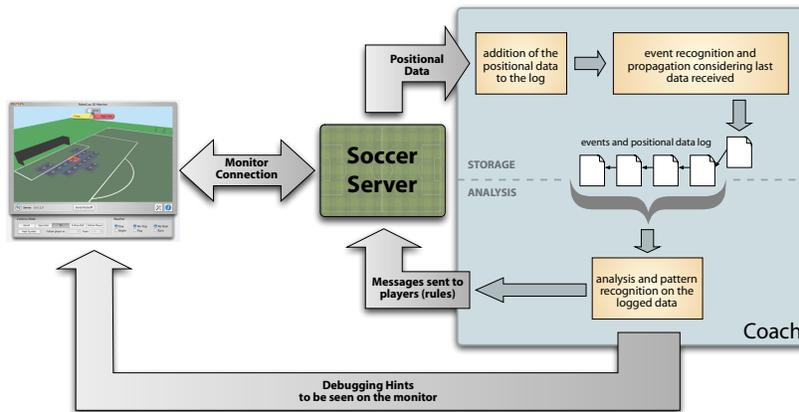
This coach makes a statistical analysis of the game being played. Data gathered by the coach includes average position and variance for all players and ball, some grade of success for passes and pass lines and recognition of pass patterns. With the results of this analysis, it can detect better positioning and formations for its own team. It can detect faulty defense positions or holes in the formation of the opponent team and convey this valuable information to its teammates.

### 3 Architecture

We keep an internal log of all relevant activity that has happened during the game. The stream of information coming from the soccer server is stored in this “log” after being processed and analyzed to try to detect important events that the coach should take into consideration when generating its advice messages.

In order to be able to debug the processing that is happening inside the coach in a practical manner, in addition to connecting to the soccer server, the coach also connects to a modified version of the RoboCup Advanced 3D Monitor[1], which has the ability to display special markings on the field. These markings illustrate the internal state and current processing of the coach, conveyed through the information contained in the messages that the coach sends periodically.

This internal architecture and the relation with other external elements of the simulation can be seen in Fig. 1.



**Fig. 1.** ISocRob Coach 2004 architecture and interaction with the other elements running in a soccer simulation.

### 4 Conclusions

The evaluation of the benefits that a coach brings to its team is a difficult task. Most of the time it’s hard to understand whether a given advice was completely understood by the players and if it actually provided any advantage to the team. It is however somewhat clear that teams tend to generally perform better when provided with the help of a coach.

We would like to improve the coach by training it in advance with logs of past games. This way it could learn to identify some commonly used strategies or set plays.

## References

1. Penedo, C., Pavão, J., Nunes, P., Custódio, L.: RoboCup Advanced 3D Monitor.  
In: RoboCup 2003: Robot Soccer World Cup VII, Springer-Verlag (2003)