UI-AI 2004 Coach Description

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Abstract. Players in simulated robotic soccer act on the basis of uncertain knowledge and unreliable communications[2]. In such environment, the coach client receives reliable data which can help the team in coordination and cooperation during a soccer game. Currently the coach can advice the players in a specified language; CLang[1].

1 Introduction

UI-AI Coach project started for the first time in year 2003, the project's main goal was based on deterministic decision making and opponent modelling systems. The main objective was to build a coach which advices different rules to a coachable team, so that it makes the team robust enough to different situations. Our coach keeps a large number of effective rules and sends a number of them to the coachable agents based on its simple opponent modelling. In this paper we will quickly address some of the details of UI-AI 2004 Coach, and the main aspects of out project.

2 Coach Architecture

Since in a soccer match, the main advantages of two team having the same powers are in the strategy they play, we defined simple sets of strategies. The strategies were simple enough to be repeated several times during a match. To power up the team's performance several predefined rules which are often known as common weaknesses were defined for both our attacking and defensive player (e.g flank passes), and the ways to block or perform the followings were defined for the players. Each player based on the knowledge which is given to him by the coach selects the right rule, therefore several simple triggers were defined for each rule so that non of the rules had any overlaps.

3 Coordination and predefined actions

To coordinate the players in the field and to gain more performance from players, the coach forced players to have one and nonoverlapping thoughts. Having nonoverlapping rules in agent's rule repository enables us to predict actions being selected by the agent in time intervals. Since each players movement is defined in our soccer game the players would have knowledge of what other players would actually think in the current situation, these situations were defined as predefined rules in our coach implementation. E.g. since the ball is in area x the player a is moving to y, so when ball is in area x pass to y.

4 Defense System

We used a simple but effective triangle defense system which closed the angle of ball to our goal with four players including the goalie. The two back players move based on ball movement and the front player has a horizontal movement. The system doesn't look flexible enough and needs further consideration since these 3 players were removed from their normal plays and were dedicated to their defensive positions.

5 Attacking System

Our attacking algorithms is defined as a potential field algorithm[4]. The opponent goal is fixed as a powerful attraction center, the more players get near to the opponent's goal the more they get attracted(closed) to it.

6 Conclusion and Future Work

The work done on UI-AI Coach Project is mainly based on deterministic and pre-predicted and predefined rules. The models therefore lack opponent modelling to a great extent. In our current implementation opponent modelling is defined as selecting rules form large amounts of predefined ones. Future work is based on applying machine learning methods such as reinforcement learning to the matter of rule selection in our project. The next step is the way we should advice and adapt in our coach[3].

References

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