YowAI2006 Team Description

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Abstract. In this paper we describe concepts and features which have been impremented and are being impremented to YowAI2006. YowAI2006 is a 3D soccer simulation team based on the YowAI2005. We have enhanced the basic skills for playing soccer, and introduce two new techniques, the agent communication and the deep analysis of the situation, to our team.

Introduction

YowAI2006 is a team for 3D soccer simulation league of RoboCup 2006. This team is based on YowAI2005[1] for RoboCup 2005. YowAI2005 is based on the sample agent called "Agenttest" which is included in the rcssserver3d package. One of the goal of YowAI for 3D simulation league is to port basic libraries and techniques from YowAI for 2D simulation league[2]. In YowAI2006, We have been enhancing the basic skills of YowAI2005 such as driving agent, kicking the ball and worldmodeling.

Now, we focus on two new techniques for YowAI2006, agent communication and deeply analysis of situation, and the current status to implement it.

Agent Communication

From rcssserver3D version 0.4, which is the package of 3D soccer simulation, agent communication is enabled. We are trying to realize agent communication by "Short Shout", which is realized in YowAI for 2D simulation. The short shout is a communication form used in real (human-human) soccer games. In short shout, agents exchange abstract message each other. For example:

Mae Mae is a Japanese word, means "Front" in a normal situation. But in the real soccer game, it means "Go forward", "Look ahead", "Pass forward" and so on. The meaning of this word can change by the situation. Thus, the agent which heard this message have to guess speaker's mind.

Gotzan Gotzan is also Japanese, means "Execuse-me". The agent which positioning is good for getting a goal may speak this word. The agent which heard this message have to guess where speaker want to kick the ball.

If an agent hears a message, the agent detects the speaker's intention. In restricted communication in the 2D simulation, short shout is a sufficient communication form. We plan to realize this feature on the agent for 3D simulation.

Deep Analysis of the Situation

In YowAI2005, We have achieved constructing worldmodel which is richer and more sufficient than the Agenttest's one. But for achieving more intelligent and effective behavioral decision, It is important that deeply analyzing relationships among the elements in the worldmodel. for example, analyzing which player will be able to touch the ball firstly. Such a player will not be figured out exactly only by culculating distances between all players and the ball, because these players and the ball have some velocity. For culculate this situation exactly, one have to culculate time-based distance. Time-based distance means, in a simple term, how long will it take to arrive at the target.

We are now implementing "Situation Judgementer", which is analyze the situation more deeply and totally based on worldmodel we have already constructed. By Situation Judgementer, we can figure out the situation which each agents is facing clearly and can make more better behavioral decision.

Conclusion and Future Works

In this paper, we described concept and some features of our 3D soccer simulation team YowAI2006. YowAI2006 is based on YowAI2005, and we have been enhancing some skills and features such as agent communication using short shout and analyzing the situation more deeply.

These are our future works to do:

– Improve basic skills which are already implemented (i.e. kicking the ball).
– Imprement advanced skills which are needed for playing soccer (i.e. dribbling, passing).

References

1. Shuhei Shiota and Ikuo Takeuchi: "YowAI2005 Team Description", RoboCup 2005 team description, Osaka, Jul 2005.
2. Shinichi Takahashi, Takuya Ako, Yasuyuki Yamazaki and Ikuo Takeuchi: "YowAI2004 Team Description", RoboCup 2004 team description, Lisbon, Jun 2004.