

YowAI

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1 Introduction

I want to do various researches by using RoboCup Seccor Server in my laboratory. However, the history of my laboratory in RoboCup is shallow and only half a year has passed since the research began. The research theme at which we aimed at first was "Real time, Distribution, and Cooperation" and it was the approaches from three sides. The outline of the team is described in this paper around World Modeling which should be called the result of "Real time and Distribution" thought to have reached at a standard level by present.

We know the effect is thin in the gauge of winning by the game even if an advanced function is provided for the agent who has the operation of the uncertainty experiencing prototyping in short time of half a year. Even if this proposes a very excellent idea, this shows no appearance as a clear result too much. Then, we did the effort to decrease uncertainty of information other than unavoidable uncertainty of information which the server added as much as possible. As a result, the agents succeeded in the considerable, highly accurate construction of World Model[1, 2] (That is, it is various informations on agent's field). This result invented surprising result. When the algorithm only of the chase the ball and the kick to the goal was installed to evaluate World Model, the team were performed close games and Andhill98, one of strong teams in Japan. Afterwards, the agents has grown up to handle the game equally to the team at a top level of Japan by having introduced the system which the introduction of a dynamic role of goalie and which efficiently uses of stamina. The architecture of agent of the team and the composition method of World Model that the uncertainty are few is described in the following.

This agent came to leave a good result of the world rally best 8 and the semi-Japanese rally victory though operated by a very simple algorithm.

2 Team Development

Team Leader: Takashi Suzuki

Team Members:

Takashi Suzuki

- Japan
- master
- remote participation

Web page <http://ne.cs.uec.ac.jp/suu/RoboCup99>

The agent executes continuously the cycle of acknowledgment, judgment, and action by synchronizing simulation cycle of SoccerServer because of the single process. The part of acknowledgment constructs World Model from information received from SoccerServer. The part of judgment decides the goal at present from World Model. Then the agent computes various conditions which is the optimal dynamic role, the offside line, and the intercepting location of the ball etc. to decide the goal. The part of action decides a short goal to achieve the decided goal and issues the command to SoccerServer actually. The behavior of the agent basically is decided by the judge by World Model at time and is put into practice.

3 World Model

Here, an important element for composing World Model is described. The synchronization which can be put on simulation cycle between Client/Server is necessary in the beginning. This is a condition to use all cycles effectively. It is that it is synchronization of step time of simulation cycle between Client/Server next. This is the most important element for composing World Model. Because, it is the only clue to know what when one information which has been sent from SoccerServer or I did when. World Model information is propagated by say message at the end. As a result, other agents can supplement information which a certain agent cannot understand and the thing to decrease the difference between each agent's World Model in addition becomes possible.

The synchronization of simulation cycle and the synchronization of step time exceed 99.9% at the origin of the best environment. In addition, the error in the information of the position and the direction of the agent itself is about 0.3 meter and about 0.5 degrees respectively.

Table 1. The result of various experiments

Experiment	Ratio of success
synchronization of simulation cycle	99.9%
synchronization of step time	99.9%
success of command execution	99.9%

4 Communication

My agent uses the communication between agents only to transmit own world model. Whether my agent communicates between agents of what time has been

Table 2. The error of value for player itself on World Model

Value	Error
x coordinate	0.2 meter
y coordinate	0.2 meter
body direction	0.5 degree

decided to each agent beforehand. Actually, only one agent uses the communication between agents once every two cycles.

5 Skills

My agent's main skill is to kick running after the ball, and the ball toward the goal of the enemy. Importance because of running after the ball is to forecast the position where the player comes in contact with the ball. Moreover, when the ball is kicked toward the goal of the enemy, my agent kicks the ball as twice as possible continuously.

6 Strategy

My agent is behaving by a simple algorithm of kicking the ball toward the goal of the enemy running after the ball. This algorithm is an algorithm originally used to debug the world model.

7 Special Team Features

7.1 Robust property

The team realized the robust property. The agent of the team has static role and dynamic role, for example goalie, defender etc. As Figure 1 when a agent with goalie of static role intercepted a ball, other agent with defender of static role defend goal. Then dynamic role is exchanged. This is judgment of agent itself.

7.2 Stamina system

The agent wastes the stamina, because the agent always chases the ball. But the quantity of movement of the agent is larger than that of the agent of the other team overall of a match. The agent does not use the stamina over threshold decreased the effort or the recovery if it is unnecessary. When the agent can shot or the enemy agent will shot, the agent use the stamina over threshold. However, the quantity of the stamina decreased for the movement increased to be concerned with the version up to 5.xx of the SeccorServer. Therefore, I must try to design the new stamina system.