Toricolor Diamonds Team Description Paper

Tomohiro Ninomiya, Yasuki Asano, Minoru Nakazawa, Yasushi Sengoku
Division of Information and Computer Science
Kanazawa Institute of Technology
Nonoichi, Ishikawa 921-8501, Japan
million@eagle-net.ne.jp

March 1, 2002

1 Introduction

Toricolor Diamonds is a new simulation soccer team, developed based on the CMUnited99's low-level parts. This team's purpose is to develop strong soccer team in the Soccer Server. This team have a positioning system learning the best play zone, the space which a player should play, to this purpose, because about 20% in the soccer game is condition that a soccer player can not to touche ball. This learning system is composited by Classifier System(CS), because this team wants each player to be a more autonomous agent that calculate a solution.

2 Positioning System

This positioning system is CS that determine my next play zone by relation between my play zone and play zones of key players and ball.

A play zone is simple to described as one block divided by grid and numbered from their side.

Key players are the players which had a specific role, goal getter's foward, game maker's defensive half and baks who defence my side, in soccer. Five players except key players and a keeper determine two key players by each role. For example, key players of a player who cover a hole of a defense and attack from a side are a side back and a foward.

The reward of classifier is given by Profit Sharing in order to learn process until a goal.

2.1 Experimental environment

Table 1 is the performance of the machine used for the experiment. The version of a soccer server uses 7.10. The parameter of this learning system is shown in Table 2.

Table 1: The machine performance.

CPU	PentimuIII 933MHz
Memory	128MB RDRAM
Video Card	Millennium G400
Hard Didck	15G
OS	Vine Linux 2.0

Table 2: The classifier system's parameter

number of classifier	1000
crossover percentage of condition part	50%
crossover percentage of action part	80%
mutation percentage	2%

2.2 Result and analysis

A table 3 is a result of games. The team which faced the enemy, a line show the number of generations of classifier in the line. As the generations of classifier increase, it knows the thing that a facing score improves from the table 3. Before a great difference was given to YowAI2000 and it won, this agent team became the 50th generation of classifier. Which will learn to win because it is successful in reducing point losts though this agent team could not win YowAI2001 by 50th generation.

When it faces a strong team, it is fatal that the application of the system is slow. But the problem of the individual will be solved, because it was a cause, the behavior when a ball was held with this time's being the learning system of the rough position was dull.

Table 3: game's result and generation of classifier

	1	10	20	30	40	50
YowAI2000	3-1	3-4	2-3	2-1	5-7	2-7
YowAI2001	46-0	43-0	49-0	26-0	21-0	7-0

3 Future Work

Since play zone of key players is related to positioning system, action of key players needs to be excellent, and since the position relation of an opponent team is not taking this positioning system into consideration, this system is invalid in many cases in a game with other opponents.

In order to develop a better positioning system, future works are to attain each player's free running by the positioning in a play zone and to develop a system which each player judges tactics by action of a defensive half.

References

[1] G.Winter, J.Periaux, M.Galan, P.Guesta, Genetic Algorithms in Engineering and Computer Science, WILEY (1995).

[2] David E. Goldberg, Genetic Algorithms in Search, Optimization, and Machine Learning, ADDISON-WESLEY (1999).

[3] Mao Chen, Ehsan Foroughi, Fredrik Heintz, Zhan Xiang Huang, Spiros Kapetanakis, Kostas Kostiadis, Johan Kummeneje, Itsuki Noda, Oliver Obst, Pat Riley, Timo Steffens, Yi Wang, Xiang Yin, Users Manual RoboCup Soccer Server for Soccer Server Version 7.07 and later (2001).

[4] Peter Stone, Patrick Riley, Manuela Veloso, The CMUnited-99 Champion Simulator Team, CarnegieMellonUniversity (1999).

[5] Lufs Paulo Reis, Nuno Lau, FC Portugal Team Description : RoboCup2000 Simulation League Champion, University of Porto, University of Aveiro (2000).

[6] Cedric Sanza, Cyril Panatier, Herve Luga, Yves Duthen, Adaptive Behavior for Cooperation: A Virtual Reality Application, University Paul Sabtier (1999).

[7] Bo Zhang, Xiaoping Chen, Guiquan Liu, Qingsheng Cai, Agent Architecture: A Survey on RoboCup-99 Simulator Teams, University of Science and Technology of China (2000).