LOGMONITOR

Analyzing Good Plays to Train Player Agents

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■ Teaching (training, programming, and learning) player agents is the challenging research in the RoboCup simulation games. LOGMONITOR is a tool for analyzing games from game records. LOGMONITORS can be used not only to improve the collaboration among agent players but also to evaluate them.

RoboCup provides challenging research for a multiagent system. Player agents must move autonomously in a dynamic environment. Teaching (training, programming, and learning) player agents is the main theme in simulation games.

Reviewing score books of soccer matches gives game data such as which players scored goals, which made shots, and which made passes. Score books are useful for analyzing games, ranking players, and making strategies for coming games. This situation is assumed to be similar to RoboCup simulation games. Using data in score books helps to program the synthetic player's function. Following RoboCup-97, the LOGMONITOR (Takahashi 2001) was made for automatically extracting good plays in simulation games to train player agents.

RoboCup simulation games are recorded as log files, where the positions of the ball and all players for both teams at each simulation step are written. It is necessary to recognize soccer plays such as shots or passes from the time-sequence data for checking a play's quality. The play recognition and its performance depend on the situation. Thus, it is similar to gesture understanding in a computer-human interface. For example, recognition of a pass requires that the ball move from one player to a teammate. If the ball were to move to an opponent, it is interpreted as an interception or shot. The pass linked with a goal should be evaluated as a high-quality pass.

LOGMONITOR (figure 1a) is a tool for analyzing games from log files and displaying statistical data such as a count of passes, kicks for each player, and the control rate of the ball.[1] LOGMONITOR is being used in two ways: First, if a team's collaboration is better than the other team, some of the statistical data, such as the number of passes, can be too much. Using log files of evaluation,[2] researchers are checking the metrics that indicate collaboration among agents. Second, using LOGMONITOR as an online agent (figure 1b),[3] the team changes its team formation according to the opponent's formation, which LOGMONITOR outputs by analyzing the game and evaluating online the effectiveness of the previous advice.

Notes

1. LogMonitor can be used as a JAVA applet, and its source code can be gained from www.bais.chubu.ac.jp/~ttaka.

2. From RoboCup-98, special games have been arranged to evaluate teams based on their teamwork, not their scores. See www.isi.edu/soar/galk/RoboCup/Eval.

3. From RoboCup-99, an online coach can be used as a twelfth member that can advise team agents when the ball is out of the field.

Reference

Takahashi, T. 2001. LOGMONITOR: From Player's Action Analysis to Collaboration Analysis and Advice on Formation. In RoboCup-99: Robot Soccer World Cup III, ed. M. Veloso. New York: Springer. Forthcoming.
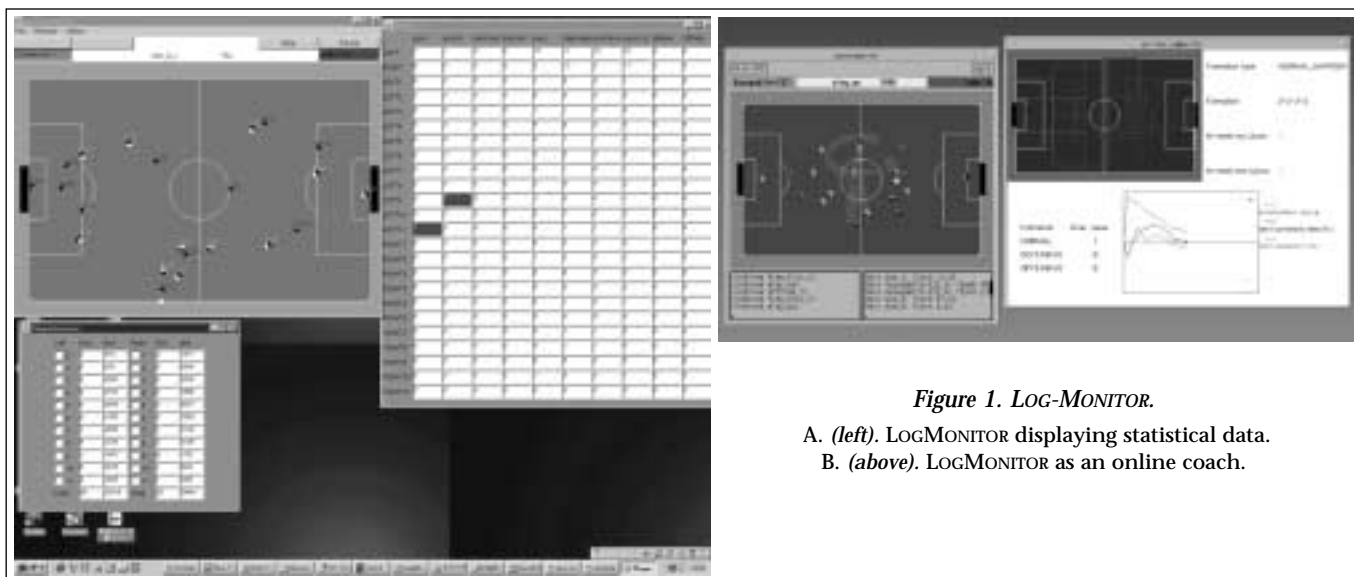
Figure 1. LOG-MONITOR.
A. *(left).* LOGMONITOR displaying statistical data.
B. *(above).* LOGMONITOR as an online coach.

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