

Kasuga-bito III: toward teamplays using online Logmonitor as online coach agent

Kasuga-bitoIII

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Abstract. *Kasuga-bito III is characterized by its on-line coach agent. Kasuga-bito III is composed of Logmonitor and Kasuga-bito II which was runner-up in JapanOpen'98 and the champion in the RoboCup Pacific Rim Series '98. The Logmonitor advises player agents the position which strategy is authenticated by analysis of the logfiles of evaluations at RoboCup'98. Our team's purpose is "from good plays detection to team with goof teamwork".*

1 Introduction

Kasuga-bito III is a composed of Logmonitor and Kasuga-bito II that was runner-up in JapanOpen'98 [JapanOpen98] and the champion in the RoboCup Pacific Rim Series '98 [Pricai98]. Logmonitor outputs statistics of RoboCup simulation games from logfiles [Taka98] and is used as analysis engine [Issac]. Kasuga-bito III coach agent's strategy is based on the analysis of logfiles of the evaluation league at RoboCup 98 [Cup98].

2 Evaluation Leagues at RoboCup 98

The details of evaluation games are available at Gal Kaminka's homepage [Gal98]. All teams participated the evaluation played against AT_Humbolt97, the champion team of RoboCup 97, four half games called phase A, B, C and D.

phase A : the game is played under normal conditions.

phase B : One player assigned randomly by a manager of the evaluation is stooped. The game is 10 to 11.

phase C : Another member assigned by AT_Humbolt97 team is stopped. The game is 9 to 11.

phase D : The goalie is stopped, the game is 8 to 11.

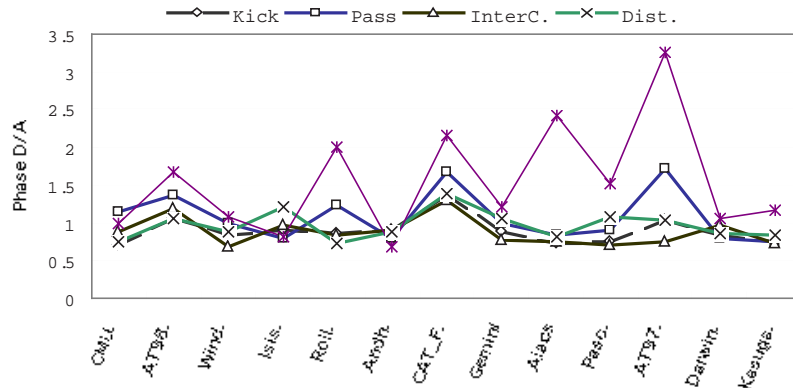


Figure 1: Changes in plays Phase from Phase A to Phase D.

2.1 Discussion from statistical data

Fig. 1 shows one of the results of the evaluation league. The vertical axis shows the ratio of AT_Humbolt97's play from phase A to D and the horizontal axis is the team. The teams with less collaboration are thought to be weak in covering disabled players, so we expect that players of AT_Humbolt97 can pass, kick and move more easily as phases changed from A to D. Against our expectation, the most vertical values of point in Fig. 1 are less than 1.0. This means AT_Humbolt97 didn't play more actively at phase D than at phase A.

2.2 Discussion from agent movement

Fig. 2 shows the trajectories of a forward player of CMUnited (left) and Kasugabito-II (right). The figures are trajectories of the same player at phase A and D. The numbers under the figure are the number of kick, distance, the variance of horizontal movement, and the variance of vertical movement. The CMUnited player is superior to Kasugabito-II player.

At evaluation leagues, participating teams could not change the programs or the parameters before the games, while the changes of programs or parameters are permitted at the regular games. We test whether the position tuning effects the score or not.

experiment 1 The games between AT-Humbolt97 and Kasugabito-II were played again in our computer environment.

experiment 2 At phase B, C and D, the initial positions of Kasugabito-II players were modified by our member.

Table 1 shows the result of the games. The running environment is different from that of RoboCup98, however, the scores in experiment 1 show a similar tendency in the evaluation games. AT-Humbolt97 became superior as phase changed from A to D, and won at Phase C on. In experiment 2, Kasugabito-II continued to win the game till phase D. Position tuning seems to be effective in making a team robust.

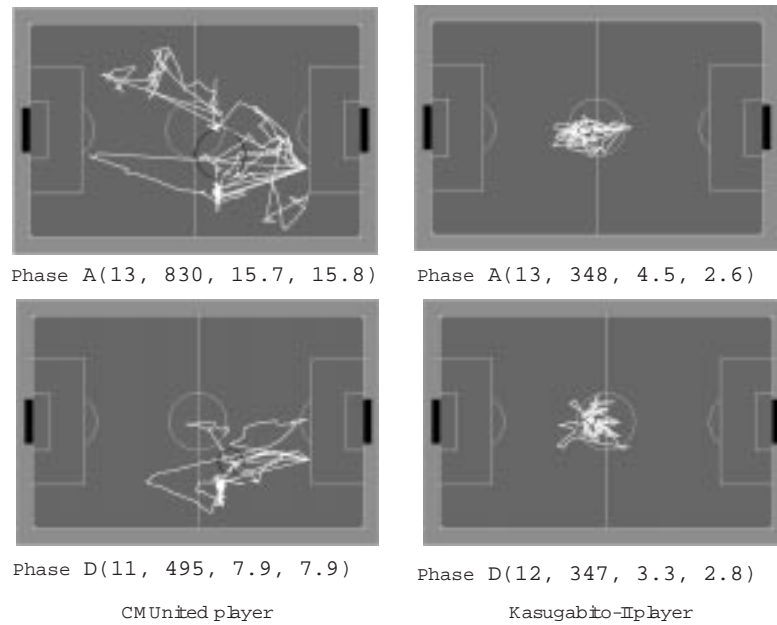


Figure 2: Trajectories of Players at Phase A and D.



Figure 3: On-line LogMonitor screen image

3 Coach agent based on Logmonitor

3.1 implementation

On line coach is introduced from soccer sever 5.06. The coach agent can see all objects on the filed and give his advice to the players at play_off time. Kasuga-bito III's coach is the improved Logmonitor which runs on simulation cycle (Fig.3). The strategy is based on the experiments in the previous section which says that the player's positioning influences team robustness.

The positions of opponent players are calculated in the following steps:

Table 1: Results of experiments 1 and 2

experiment 1											
	AT_Humbolt						Kasugabito-II				
	Sc.	K	P	I	1-2	D	K	P	I	1-2	D
A	3 - 0	106	41	53	0	2553	118	27	55	0	2706
B	2 - 1	75	25	37	1	2042	72	16	34	2	1869
C	1 - 2	89	29	52	0	2265	81	17	49	0	2287
D	0 - 3	99	42	40	0	2303	81	18	34	0	1974

experiment 2											
	AT_Humbolt						Kasugabito-II				
	Sc.	K	P	I	1-2	D	K	P	I	1-2	D
A											
B	3 - 1	103	41	44	0	2333	86	20	41	0	2311
C	3 - 0	111	42	54	1	2509	103	26	51	0	2264
D	2 - 1	88	33	43	0	2249	91	20	42	0	1977

Sc.=Score K=kick P=pass I=interception
 1-2=1-2pass D=distance

- Players far from the ball are their default positions. (Conversely, players near the ball move to catch it.) The players far from the ball more than 30 m are to be calculated.
- The newer data are supposed to be the more confident. (The players may change their position as the game goes on.) The average of new 100 points satisfied the above condition are set as the opponent players' position.

The coach's advice are generated by the follows principles:

defender (offside trap advice): When opponent players are within 10 m and their direction are toward their goal, the coach advice the defenders move 10m forward.

(position back advice): After the defender moved, there is no opponent within 10m in their back, the coach advice them return to their default position.

forward The top forward is advised to move 5m behind the opponent offside line.

others The other players are advised that they are proportionally spread between the top forward and the defenders.

3.2 Experiments on Coach agent

Table 2 shows the scores of the games with three team, AT_Humbolt97, Andhill98 and Kappa. Andhill98 is known as the team which changes players' during the game. Coach version won games with Andhill98

Table 2: Scores of games without /with coach.

AT_Humbolt		Andhill98		Kappa	
without	with	without	with	without	with
1 - 6	0 - 7	3 - 1	7 - 1	0 - 6	0 - 10
0 - 7	0 - 11	2 - 2	3 - 4	0 - 9	0 - 7
0 - 8	1 - 8	3 - 1	1 - 4	0 - 8	0 - 13
0 - 10	0 - 6	3 - 3	1 - 4	0 - 8	0 - 5
0 - 8	0 - 8	1 - 2	4 - 1	0 - 5	0 - 5

right score is KasugabitoIII's score.

more than without coach version. This result supports the coach advice's effective in robustness.

4 Summary

Kasuga-bitto III is characterized by its on-line coach. The positioning principle is authenticated by experimental fact that the team with good initial positioning showed good scores than the original one. Kasuga-bitto III's coach advises the positioning to make Kasuga-bitto III robust. Kasuga-bitto III's agent is now developed under the principle "from good plays detection to team with goof teamwork".

We appreciate the RoboCup98 committee who planned the evaluation league, AT-Humbolt team who prepared AT-Humbolt 97, and Gal Kaminka who edited the logfiles.

References

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