

CSU_Yunlu 2D Soccer Simulation Team Description Paper 2015

Tao Huang, Jieli Yin
Fu Jiang, Xiaoyong Zhang, Jun Peng

School of Information Science and Engineering,
Central South University, Changsha,
Hunan Province, China

Jiangfu0912@gmail.com toy_bricks@csu.edu.cn jellyyj1@foxmail.com

Abstract: CSU_Yunlu is a 2D soccer simulation team which has been participating in the RoboCup competition since 2002. In these past years, our team has got some achievements in this field and it was growing rapidly more than our expectation. In recent years, the 2D soccer simulation teams from all over the world have made a rapid progress such as WrightEagle, Helios and so on. In this paper, we briefly describe the scientific focus of CSU_Yunlu, our current research efforts and the recent improvements since the late competition.

Keywords: CSU_Yunlu formation tackle offence defence

1 Introduction

CSU_Yunlu 2D soccer simulation team, which was established in 2002 by School of Information Science and Engineering of Central South University, is a simulated soccer team for the RoboCup soccer 2D simulator. The team participated in the RoboCup China Open 2002 and ranked the 3rd place.

In 2004, CSU_Yunlu started to adopt UVA_base_2003 as the base code. In these past years, when we built our team on the base of UVA_base_2003, we used a dynamic role-based cooperation model and a decision algorithm based on the behavior of Multi-Agent System (MAS) in our team, so the team was good at cooperation. In the RoboCup China Open 2010, CSU_Yunlu got the 7th place of 2D soccer simulation. In the next year, CSU_Yunlu changed the base code from UVA_base_2003 to agent2d.

In 2011, CSU_Yunlu was based on agent2d-3.1.0, a well-known base code developed by Akiyama et al. Thanking to our continuous efforts, CSU_Yunlu gained 2nd place in the RoboCup China Open 2011, which was a big breakthrough for us. In

the Robocup China Open 2012, we ranked 5th place after we made a lot of improvements on the research of last year.

So far, based on agent2d - 3.1.0 source[1], CSU_Yunlu has been improved continually. During the time, under the pressure that all teams have made great progress in domestic country, CSU_Yunlu has achieved good grades in the RoboCup China Open. In the RoboCup China Open 2014, our team worked hard and won the 5th place in fierce competition. CSU_Yunlu made a draw with YuShan ranked 2nd place, and was lost to Jaeger with one goal.

CSU_Yunlu has been working hard to improve itself, and actively participates in various games. We sincerely hope that we could find out our shortcomings and the solution to problems in communication with classmates. Only in this way can the teams' overall performance be promoted.

We hope we can participate in the RoboCup 2015 Soccer Simulation League, 2D competition to improve ourselves and test the development since the late competition.

2. Direction of Improvement

2.1 Formation

On the formation, two parts mainly changed. For one thing, we changed defensive formations in the area around the guards and defensive midfielder's stance. Nowadays, offensive ability of every team is generally strong, so we weakened the defender of active defense and changed the defending strategy to midfield. Practice has proved that it is very useful. Our team shows the excellent defensive ability in the RoboCup China Open 2014. For another, we specially optimized the N type corner formations (Fig 1). Although the man-marking ability of teams is good, our team could gain the corner points.



Fig.1. N type corner formations

2.2 Tackle Strategy

Tackling is an effective mean of defense in football. However, at the moment, we applied the defensive tackle to different defensive situations even offensive situations. Consequently, the defensive ability of our team has improved a lot, and we have various ways to tackling. In the defense, we roughly divide the pitch into three types: the forbidden zones, the boundary area and the rest of the areas. We applied the defensive tackle to the situations.(Fig2,3,4) At present, in the game with the other domestic teams, the success rate of tackles has been significantly improved.



Fig. 2.The defensive tackle applied in the boundary area



Fig .3. The defensive tackle applied in the forbidden zones

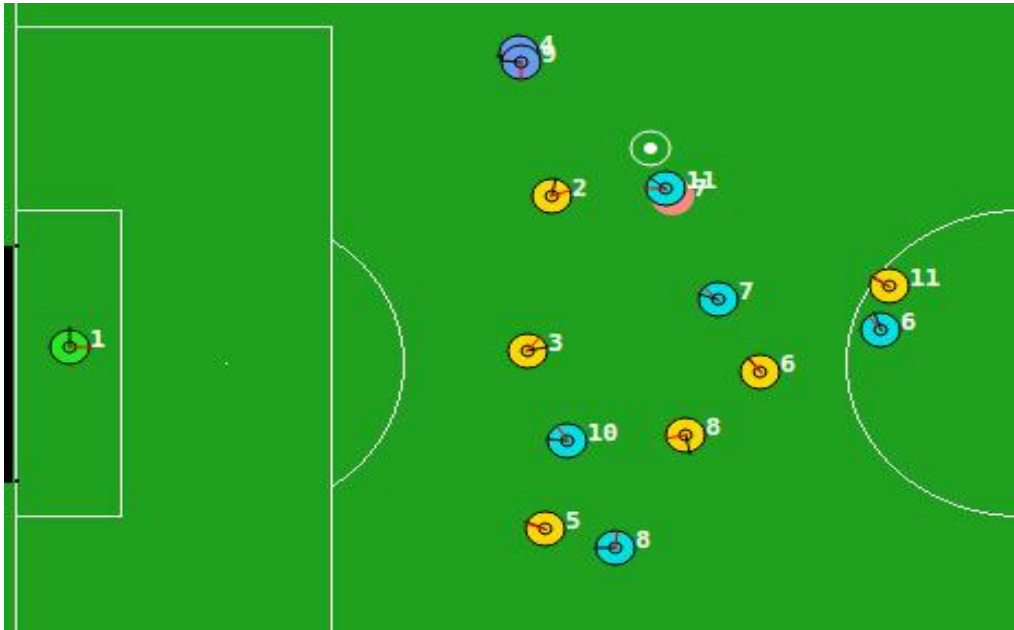


Fig. 4. The defensive tackle applied in the rest of the areas

3.Conclusion and future work

Recently, great efforts should be spared to advance the evaluator of action chain, since its performance in shooting and passing the ball are not good. The capabilities of players have been promoted individually. Under the changing situation, some necessary modification should be taken to the former evaluation scheme. Our team ,this year, really want to add running with coordination to the scheme, offence with coordination in particular. It is bound to be the powerful tools for a wonderful score. However, struggling to the limited time, we have not yet implemented this in the code. Surely, another orientation of focused research is the communication module. It is necessary to accomplish the whole team's tacit cooperation. For example, we should think highly of the problem that how to perform excellently and efficiently in the communication and signal processing between players.

In this paper, we have briefly presented our current work to CSU_Yunlu. Although we have made a lot of effort, the team still has plenty of room to develop. In the next period, we will focus on the reinforcement learning method and the intelligent cooperative strategy.

References

- [1] <http://sourceforge.jp/projects/rctools/releases/51943>. [EB/OL], 2012.
- [2]. Peng, J., Wu, M., Cao, W.: Some Key Techniques in RoboCup Simulation League [J]. Computer Engineering, 2004, 30(4): 49-51
- [3] Peng, J., Wu, M.: Multi-agent Cooperation Model Based on Action Prediction [J]. Computer Engineering and Applications, 2005, 41(9): 23-25
- [4]. Zhang, X., Peng, J.: Realization of Pass Ball Strategy in RoboCup [J]. Computer Engineering, 2004, 30(23): 123, 149
- [5]. Li, S., Chen, J., Sun, Z.: Structural design and implementation of Tsinghua Robot Soccer Team [J]. J Tsinghua Univ (Sci & Tech), 2001, 41(7): 94-98
- [6]. Yun, J., Zhang, X., Wei, X., Wang, C.: Key tactics of intercepting the ball, possessing or dribbling the ball and running in RoboCup [J]. Journal of Inner Mongolia University of Science and Technology, 2009, 28(2):136-142
- [7]. Peng, J., Ding, C.: Realization of formation strategy in RoboCup. In: The 2006 International Conference on Artificial Intelligence, 2006/6/26.
- [8]. Akiyama, H., Shimora, H.: HELIO S2010 Team Description. In: RoboCup 2010: Robot Soccer World Cup XIV. Volume 6556 of Lecture Notes in Computer Science, Springer(2011)