

MT2019 Robocup Simulation 2D Team Description

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Abstract. MT2019 is a team of 2D soccer simulation league which is consisted of the students who are coming from Hefei University and all of them are with strong robot enthusiasm . Since 2012, the MT2019 team has participated in RoboCup China open tournament and RoboCup World Cup every year and has achieved many good results.This paper briefly describes the background of MT2019 and the main works of our team since the 2018 RoboCup World Cup. Through these works we have greatly improved the overall capacity of our team.

1 Introduction

MT was founded in 2012, by the Hefei University Department of Computer Science and Technology Innovation Laboratory of a group of robot-loving soccer students. During the seven years, we take an active part in annual competitions of RoboCup. And there are some achievements, in 2012 and 2013 we won the second prize, in 2014 we won the grand prize,in 2016 Portuguese open tournament the champion,third in RoboCup World Cup,we sixth in the 2017 RoboCup2DWorld Cup,third in the2018 RoboCup2DWorld Cup.By the communication with other teams, we found some deficiencies,and then proposed improvement measures. We hope to verify the effect of improved code in this year's competition, and improve the team's level gradually.

For this competition, We started the strategy improvement in August,the attack and defense ability of the team has been greatly improved on the basis of last year. We hope we can get remarkable achievements,make more friends, and learn more things in this year.

2 The underlying of the MT2019

We use agent2d-3.1.1 as the underlying code, the download address

is:<http://en.sourceforge.jp/projects/rctools/>.Using librcsc as the underlying database, the team's underlying is action-chained style.We have been the repaired and improved on the basis of MT2018.

3 Pitch divided and Player role split

The traditional pitch division divides the pitch into 15 parts(as shown in Figure 1),the new pitch division divides the pitch more detailed(as shown in Figure 2).In the new pitch division, the front pitch is divided into Danger, Risk, KickChance, Holder, Sill, Poise, Reserve and Sente,divide the pitch more carefully.At the same time,we also use the traditional pitch division at the behind pitch.

Agent2d divides the roles of a player into centers forward(11), sideforward(9,10), offensivehalf(7,8),denfensivehalf(6),sideback(4,5), centerback(2,3), and goalie(1).

In Robocup competition, different course divisions have different influence on the formation changes of players.In traditional player partitioning, some players share one code file.If we want to change the player's attributes, we need to change all of them .This practice is not conducive to the maintenance and innovation.So we see each player as an independent player,break up the code,write the player properties separately, way we can use different formations against different teams.

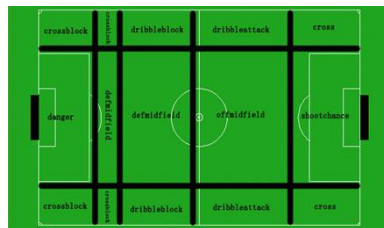


Figure 1



Figure 2

4 Corner kick strategy

At the World Cup in Russia,England put on a brilliant display at the World Cup with a six-game winning corner kick.Aiming at the problem of low scoring rate of corner kick in the past,we borrowed from England's corner kick to develop a new corner kick strategy:concentration of offensive players,attacking players scattered and attacking player ran backwards.

(1)Concentration of offensive player

Attacking players gather in the middle for the first time, leaving space around and waiting for the next move.After the corner kick, a number of players immediately scattered to move directly into the penalty area.

(2)attacking players scattered

After the corner kick, the player without ball moved quickly around and spread out, cover and attract defense, the defenders' quick marking and dispersal exposed the middle space, the attacking player shoot at once. Through the deployment of the opponent's defensive focus, to complete the shooting

(3) attacking player ran backwards

The opposing defenders are concentrated in the centre point and front point, the server player tries to send the ball to the back point, at the same time attacking players move back in time. After receiving the ball, the forward player cooperate with the attacking player to complete the attack immediately.

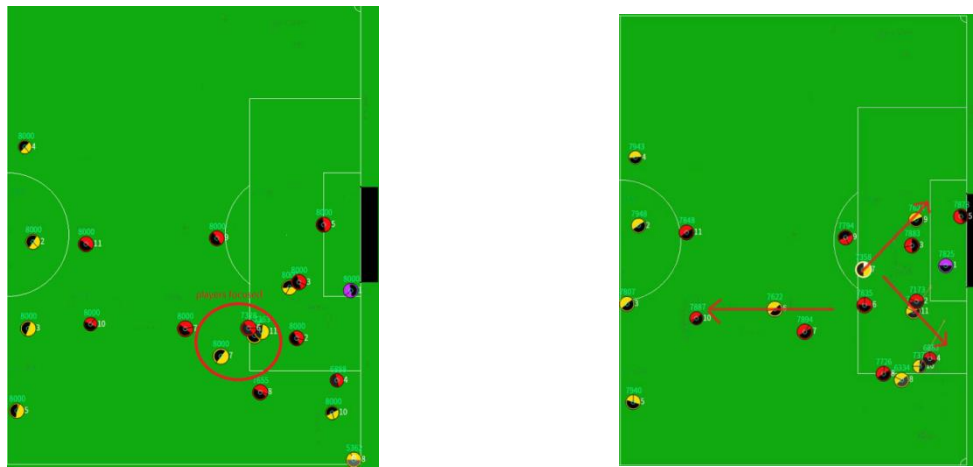


Figure 3

All three strategies are dynamic attack strategy. Its main feature is to move the players and reasonable cover. Unlike traditional tactics, players play with new strategies which means greater flexibility. Whether it is marking, joint defense, or against the players defense, can be easily solved. For these three strategies, we make the best choice according to the situation on the field.

5 The Application of Simulation 2d Match Log in the Team

In the past, when we developed the 2d project, the strategy model can only be designed through human experience, find out the problems in the team by watching the test competition or the game playback, and modify the team code for these problems. This kind of development idea can solve the problem, but the cycle is longer, and the strategy design is short of reference and waste lots of time.

In the process of RoboCup simulation of 2D competition, a log file will be produced to record the detailed data of the game.

Using simulate 2D log files as data source, using data mining and machine learning algorithms and a large number of data sources. Finally, the model is applied to the

development of the simulation 2D team strategy, enhance the team's offensive and defensive abilities.

Now, we can use log to get all the information in a game and determine the player's strategy according to the log. We use these information for positioning analysis, movement analysis, shoot analysis ,etc.The efficiency and accuracy of the development have been greatly improved.

6 Summary and Outlook

In the past seven years, MT has been improving, but we still have a lot of inadequacies that need to be improved, and there are still a lot of ideas that have not been realized. We will do our best to study RoboCup. We are trying to use deep learning and intensive learning to train our team and we are going to use more smarter algorithms in RoboCup. The RoboCup is a good opportunity to learn from other teams, we will learn the strengths of other teams, improve our weaknesses, and with teams from all over the world, we will make the RoboCup simulation 2D soccer better and better.

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