Hermes2D Soccer2D simulation Team Description Paper

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Abstract. This article contains descriptions of Hermes2D activities. This year our team tried to increase the accuracy of defense strategies. We used some figures to describe the strategy. The introduction of the team and the duration of our work are explained in the article. To sum up things, the work we have done will be explained in the conclusion.

Keywords: Robocup, Soccer 2D simulation, defense strategy

1   Introduction

RoboCup is an international scientific initiative that aims to improve the capabilities of intelligent robots. The goals of the 2D football simulation league are as follows. First is the development of simulators that form the infrastructure of the simulation system and simulate realistic phenomenaprevailing in disasters. The second is the development ofintelligent agents and robots that can play a role in disaster response scenarios. The Hermes team is going to participate in this competition for the first time in 2023. This team has dedicated four months to learning programming with c++ language and then worked for one month on improving Base Agent algorithms. We are coding in [stater-Agent1][1]. So far, we have worked on defensive strategies such as marking and makeup, and in the future, we plan to improve shooting and passing and defensive strategies in the base code.

2   Related works

Hades2D and Cyrus have worked on defense strategies [4][7]. Perspolis team has worked on offensive strategies by training the preference values of actions in different environment and using the preference values of ants' foraging behaviors, as well [2].

3   Defense

3.1   Mark

This strategy is implemented when the ball is in the hands of the opponent. If the ball is in the hands of the opposing team, first we find the three insider players and the opponent closest to the ball, and in order, the closest insider player to the ball is to take the ball from the opponent's player to the opponent's player[3]. We send to the ball,

then to block, we send the second insider player close to the second opponent player close to the ball, and also we send the third insider player close to the third opponent player close to the ball[8].

3.2   Formation

six rectangles are marked along the field (three rectangles in the opponent's field and three rectangles in our own field) each of these rectangles is named according to the coordinates of the ball in each rectangle (in the opponent's field and in their own field) These arrangements are defined according to the coordinates of the ball in different conditions.[4] , [7]
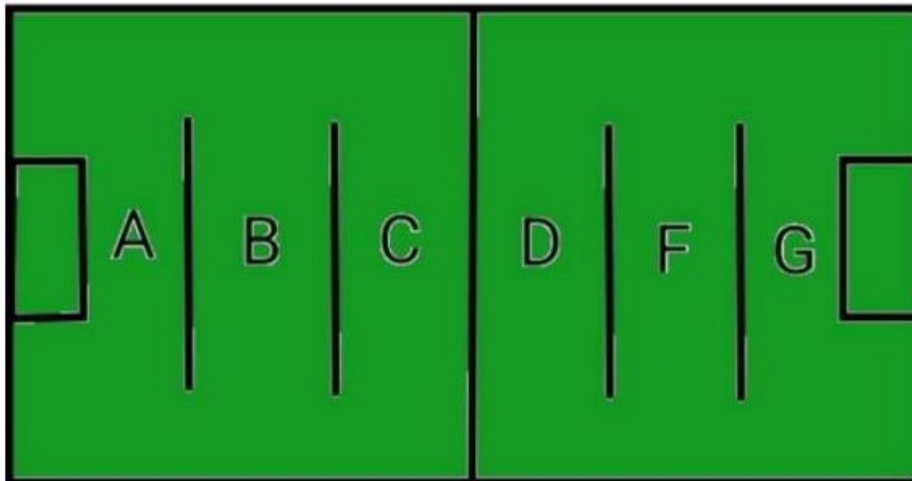

Fig. 1 . three rectangles in the opponent's field and three rectangles in our own field

4 Offense

4.1 Shoot

This strategy is for when the players are in the penalty area. This strategy is that we place the ball only in front of the goalkeeper. In this situation, the distance between the player and the ball and the distance between the goalkeeper and the ball is checked before scoring[2]. to be If there are conditions, first the distance of the goalkeeper from the left and right poles is checked, then we consider the best shot point (the farthest point from the goalkeeper and the point that has the highest scoring percentage) with 18 points and we score a goal. This strategy is not finalized yet as we have some difficulties.

5 Conclusion

This paper described the previous efforts and the current research topics of the Hermes2D team. defense algorithms made it possible for us to choose the proper positioning against the attack of the opponent players. You can see the results and improvements analyzed by Autotest [6] in the table below.

The Greek alphabet

Name	Hermes2D	Base
Goals	443	57
Points	213	87
Avg Goals	4.43	0.57
Avg Points	2.13	0.87

Table. 1. The Autotest result in 100 games.

6 Future ideas

Our team is currently working on several algorithms. Some of these algorithms are as follows.

6.1 Block

Blocking is executed when the ball is in the opponent's hand. In this situation, we first want to find the closest inside player to the player with the ball, then bring the inside player closer and try to limit the field of vision of the player with the ball so that he cannot Pass to your teammates.[4]

6.2   Pass

When we have the ball, two insider-attacking players are around the ball holder (insider). If the player with the ball is being blocked or marked by the opponent's players while taking the ball in front of the opponent's goal, he passes to the insider player so that we can pass the ball[8]. to have earlier than the opponent's players. This work continues until we enter the shooting strategy.

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