S2PLUS

2D Soccer Simulation Team Description Paper For Iran Open 2012

Mahmoud Ehsani Ardakani,
Hossein Omidvarmohammadi,
Amirreza Barghamadi,
Hesam Falakfarsay Nowbar

Salam Dibaji High school
Tehran, Iran
E-Mails: mahmoud.ehsani@programmer.net
h.omidvar@programmer.net
a.barghamadi@programmer.net
h.falakfarsa@programmer.net

Web: http://s2plus.blogfa.com

Abstract. S2PLUS is a 2D soccer simulation team, based on WRIGHTEAGLE_BASE[1]. Our team has been researching about Robocop 2D soccer simulation and made hard efforts for 3 years. This paper describe the main features of our team, S2PLUS, going to participate in Robocup Iran Open 2012 international competitions. New approaches of aggressive and defensive methods in new edition of our team are going to be mentioned in the description paper.

Key words: 2D soccer simulation, WRIGHTEAGLE_BASE, Robocop, This paper

[1] WRIGHTEAGLE_BASE 2.0.0 (is available from http://ai.ustc.edu.cn/en/robocup/2D/releases/WrightEagleBASE-2.0.0.tar.gz)

❶ Introduction

2D soccer simulation league is an international class generated to realize the main goal of Robocup. There are different fields in Robocup including manufactured intelligence, hardware, electronic and mechanic. We based our focus on manufactured intelligence and simulation in 2D soccer simulation. So far, a lot of work has been done on the mentioned fields. We have tried not only to take advantage of the outcome of the advancements, which have been published in well-known journals, but also to use new methods and to put our own ideas into practice. For doing so, together with the study of A.I. and the prerequisites of the relevant issues, we have concentrated on specific parts of A.I. In addition, we have attempted to develop the proposed ideas in Collective Intelligence using an applied approach. We used a powerful base named Wright Eagle Base (2.0.0). Along with using the functions and allowed parts of the base, we have designed and implemented our own infrastructures. Moreover, all sources and codes we have used in our team are under the GNU/GPI license. In this paper, we will also explain every algorithm or new idea we have used in our team.

❷Pass

One of the main skills used in S2PLUS is “pass” which consists of three parts:

1) Pass Ahead
2) Pass direct
3) Pass clear

1) Pass Ahead

This part is the pass main structure, or in other words, crude pass of the team.

2) Pass direct

This part is activated in a specific time of attack, which will be discussed in main forward section.

3) Pass clear

This part is activated when an S2PLUS_Agent is not able to pass or move the ball, or to dribble the opponent's agent. In such situations our agent drives the ball away or shoots it to the outlines.

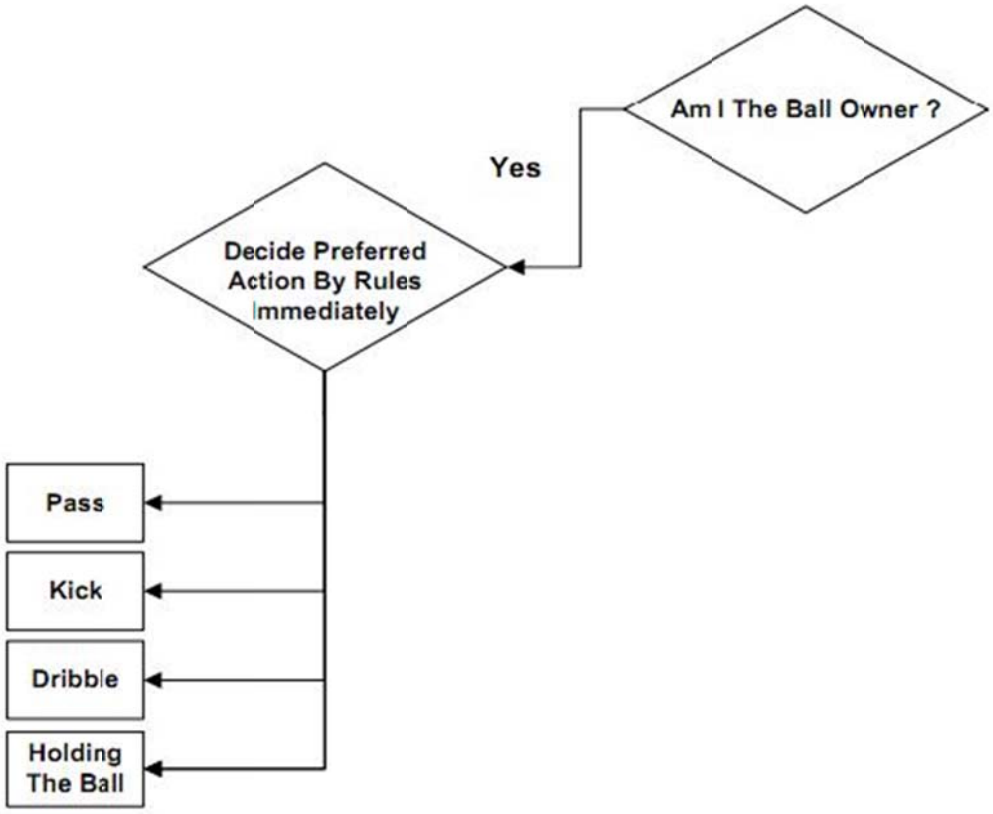
❷.1 Decision Making

The most significant part of our Intelligent System is its Decision Making ability.

Although WRIGHTEAGLE base is able to segregate A.I. skills, S2PLUS 2D team have tried to improve some parts of this skill by observing Logs of international games. This part asks some defined questions and tries to answer them by prioritizing the questions. These questions are:

1- Am I balling owner?
2- Which position is better?
3- What want The agent who will catch ball do?
4- Which point is better to end of pass?
Etc…

The map of the program is shown below:



The main skills of "decision" in pass include:

A) Deciding on the kind of the pass
B) Choosing the best agent
C) Conditions of passing

A) Deciding on the kind of the pass

There are some conditions considered by the agent controlling the ball

B) Choosing the best agent

The main goal of this part is obviously to pass flawlessly. To reach this goal, the agent asks the following simple questions:

1) Are there any opponent's agents in the way of the pass?
2) Is the catcher the goalkeeper?
3) Is the catcher in a better situation than I am?
4) Am I in the effective distance with my teammate?

C) Conditions of passing

The main factors of this part are: distance, angle, direction, power and stamina.

❸Shoot

Shooting is one of the most significant skills that all the aggressive players require and the game results also depend on it. Each team tries to program their shooting function more precisely so that they could score more goals.

Unfortunately, this part has not been completed yet and is being programmed. However, to explain how it should work in general, it can be stated that before deciding where to shoot, the agent with the ball draws two virtual lines to the goal's posts in order to shoot. In the future, the agent with the ball will draw two virtual lines to the goal's posts and one to the goalkeeper in order to choose the wider angle to shoot.

❹ Dribble

The skill implemented here is quite simple; the agent finds space around the opponent's agent that is in front of him and passes it. S2PLUS_Agent has two models for the speed of dribbling: Normal and Fast. It works in this way that the agent measures the distance between the opponent's agents, according to which it chooses the model between Normal and Fast to dribble the opponent's agent. The dribble process includes the following factors: the amount of the vacant space, speed, the power, and the stamina.

❺Conclusion

In this paper the main features of s2plus team and the agent's skills have been discussed.

We have used new methods of passing, dribbling, and shooting. We have strongly developed the agent's deciding ability, which have influenced the agent's skills in all aspects.

Even though the benefits of using the using the WRIGHT EAGLE base, which have not been used in Iran open international competitions before, may not outweighs the risks, we have used it to introduce it to entire Iran and also to increase our knowledge in Robocup 2d simulation. All of our new ideas we mentioned are following this goal, to improve Robocup.

❻Acknowledgement

Our team gratefully acknowledges Mr.Vahid Khodabakhsi for teaching us programming skills, Salam Dibaji's high school department for accommodating our needs, and Mr.Saeed Sabeti and Mr.Farzad Shirazifard for helping us writing our team description paper.

❼Reference

[1] Robosina from scratch, Nima Kaviani, Mostafa Rafaie-Jokandan. Bu-Ali Sina University. Department of Computer Engineering. May 2005

[2] Nourozi.A paper about manufactured intelligence and logic

[3] Wrighteagle Team Description Paper Soccer Simulation 2D League, Robocup Competition 2009

[4] Oxsy Team Description Paper Soccer Simulation 2D League, Robocup Competition 2009

[5] Fc_Pars Team Description Paper Soccer Simulation 2D League, Robocup Competition 2010

[6] H.Omidvar, A.Amini , M.Ehsani , A.Ameri , B.Hasani , A.Barghamadi S2Plus Description Paper Soccer Simulation 2D League,Khawrazmi Competition 2010

[7] Cai Yun Peng , Li Shi , Global planning from local eyeshot : An implementation of observation based coordination in Robocup simulation league

[8] H.Shimora & H.Akyama , Helios base