11monkeys3 Team Description

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Abstract. For these three years, we have been trying to build an accurate world model for the agent to select a best/better behavior. This required a lot of resources of the system, though it is still impossible to get the exact world model. So we stood back to the point: Why are we trying to get an accurate world model. It is only because we believed that an accurate world model would help the agent determine the best/better behavior to win the soccer game. If the agent could select best/better behavior with less information, our requirement is fulfilled. So, this year we have worked to build a world model that has minimum but enough for the agent to determine its behavior.

1 Introduction

This is the 3rd year since 11Monkeys first joined the RoboCup. On the first year, Shuhei Kinoshita started developing the team based on the three- layered structure. And on the second year, we tried to build a better world model, and used the immunenetwork algorithm to determine the agent 's behavior. Using the immune-network didn't really work well, though it was an interesting theme to work on. This year, immune-network is taken away, and our theme is to let the agent determine its behavior by the minimum information. For the past two years, we were trying to build a world model that has a considerable precision. Because we thought that accurate world model will allow the agent to select the best/better behavior. This logic may be true, but it required a lot of the system's resource. And it is impossible to get the exact world model, when we think of the real world. So, this year, we decided to build a system with less calculation to get an accurate world model, but still can select a best/better behavior.

2 World Model

So, how much information does the agent need to determine its behavior? In the past, agents in 11Monkeys had information of the whole soccer field. But do they really need to know what's going on in the whole field? It may be better than not having it, though it is not that necessary enough to waste the system's resource. And because the world model was not always accurate, it often caused conflict between the agents. This lead to a problem, the agent selected an unsuitable

behavior due to the conflict information. In the new world model, we narrowed the agent's sight, little by little, to find out the suitable area an agent 's world model has to cover.
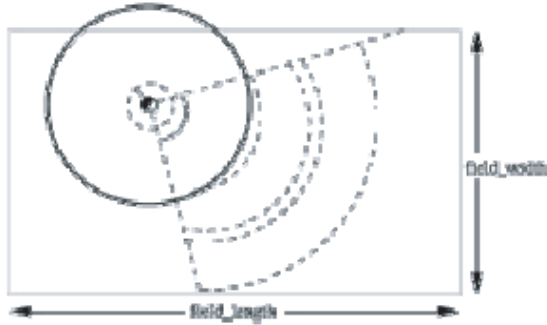

Fig. 1. Difference between the new world model and the old model: In the old model, the agent was trying to keep information of the hold field, but in the new model, agent keep the precise information of the circled part, and doesn't really care about the whole field.

We changed the diameter of the circle, i.e. the world model/the agent's view area, and did the simulation. What we found out was: When diameter less then 5m, agent needs accurate information. This area contains enough information for the agent to determine its behavior. When diameter is over 40m, there is less effect to the game whether the agent has an accurate information or not.

3   Other Changes from the Former Version

In the former version, we had some problems with the goalies. When the goalie couldn't decide which direction to kick out the ball, especially when the agents gathers near the goal, it used to determine the direction randomly. Because of this randomness, it sometimes kicked the ball into its own goal. To get rid of this problem, we allowed the goalie to move around the goal, to escape from getting into the crowded part. And we also made a limit to the direction to kick out the ball. Now we don't have the own-goal problem.

4   About the Coach Client

Our team is not using the coach client for now. Using the coach client may be effective to win the competition. Though we think that in the real world, existence of something like a coach client is rare. And when the coach client is

used, each agent is no more an autonomous agent. We want to make research on autonomous agents, so that is why we aren't using the coach client for now. We might use it in the future.

5   Result

As a result of this year's development, it became a little bit better then the former version. When we compete the new team and the old one, the probability that the new team win is about 62.3%. This number may prove that it has got better than the last year.