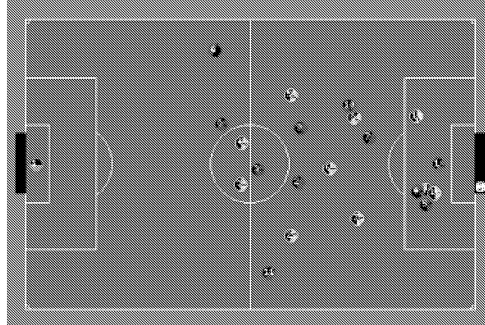


# RoboToos1 2009 2D Soccer Simulation Team Description

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**Abstract.** This paper presents an overview of the Robotoos1 strategy of soccer simulation, concentrating on the algorithms of action-selection used in our team. Soccer simulation is a distributed, dynamic, real-time environment providing a match between two teams of intelligent agents [1][2]

## 1 Introduction

Since we started Robotoos1 team we have had few experiments of participating in leagues. Our team is based on UVA base source but as we found many necessities, we started to find best strategies to get better results. We specially focused on action-selection and defending which we tried to summarize our strategies as follow.

## 2 Action-selection

This could be the most important part of a soccer simulation team and there are many strategies to select best actions in an exact situation. Robotoos1 algorithm of selecting best actions is based on ranking each action with its own parameters. For example for shooting we have: distance to goal, density of opponents in my area, my stamina. Then we select n best shoots in n points of goal line and for each one these parameters are computed.

$$\text{Shoot rank} = \frac{\text{Stamina}}{\text{Dist 2goal} \cdot \text{Density}}$$

Best shoot is the highest rank. The same algorithm is used to find best pass or best dribble. Now the problem is to find best action between these three. Our solution was that we let each action a priority that shows how much it could be successful by comparing it with the ideal action conditions. Now we can choose the action with the highest priority. [3]

Shoot	Dist2goal	Density	Stamina	Shoot angle view
Pass	Dist	Density pass point	Interception probability	X pass point
Dribble	Dist2goal	My density	Y  my position	Distance to offside line

### 3 Defense

One of the important skills to win a match is to keep the goal difference as many as possible. So we should have a good defense whether goalie or agents. Here we explain how our strategy works.

Each agent should mark an opponent which has the highest priority in his view moreover did not marked by another teammate.

The priority for opponent is computed as follow:

$$\text{priority} = \frac{\text{information novelty}}{\text{Distance to penalty point} \cdot \text{Dist 2me}}$$

We have three types of marking, goal mark, bisector mark, ball mark. Each type is appropriate for a situation. For instance when a pass from center of pitch comes to an opponent the best way of marking is to stand between opponent and goal-goal mark – not to let him escape into our penalty area. We had a partitioning in our side to find best type of marking:

1	2
3	4
5	6

This algorithm also has a little noise but with updating our information the problem is resolved.

### 4 Conclusions & Future works

This was just a point of start to our team and still we have capacity to improve our strategies. As our knowledge increases we can use other algorithms in our team. We are hoping to include fuzzy logic in some of our functions in order to decrease the noise of our actions. Furthermore we can work on coach to set our formation, get best strategy of playing by analyzing our opponents (learning) and so to realize our purposes. [4]

### References

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