YowAI2005 3D Soccer Development Competition

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Abstract. In this paper we describe a new agent model. We call this model "Columnar Model" which has more reality than the current agent model. With our model, we can introduce various concepts to 3D soccer simulation, say, heading, and trapping.

Ball Model

The current agent model on 3D soccer simulation is "ball" agent. This model has a lot of problems. For examples,

- The only action that agents can do against a ball is kicking. In addition, actions for kicking the ball is unnatural (agents must run around the ball).
- On the "ball" agent model, we can't make efficient use of the concept of height which is an important concept in terms of treating 3D soccer simulation. On the "ball" model, it is easy for agents to jump but it is very difficult that act against a soccer ball while the agent jumping.

Because of these problems, the current 3D soccer simulation is far from ideal soccer simulation. So, we suggest a new agent model.

Columnar Model

An essential concept of RoboCup soccer is that developing a team of humanoid robots that can win against the human soccer team [1]. But, the current "ball"agent model is too far from humanoid robot. For more realistic soccer, the following is needed:

- Agents have a high degree of freedom for dealing a ball. For example, ball keeping, trapping, and wide variation in kicking.
- The concept of height is used effectively. In real soccer game height is one of the key for getting ahead opponent team.

The current "ball" agent model doesn't have any of those described above. So, We suggest "Columnar Model" which will be realistic than the current 3D soccer simulation. It would be more realistic if we implement arms or legs of an agent,

but such model will be very complex and difficult to use in the simulation with respect of machine power and complexity of agent control. The model we propose is much easier for simulation We are planning to do:

- specify the details of the Columnar Model.
- imprement the Columnar Model on the current 3D simulation framework.

Specification of Agent on Columnar Model

On our Columnar Model, we can implement various features as follows.

heading By introducing the concept of height, we can discriminate kicking and headding. If agents can head the ball, we will enjoy exciting agents' aerial combat.

trapping In the current 3D simulation, agents have no method for trapping the ball. This makes the current 3D agent feel difficult to control the ball. In Columnar Model, we will introduce agent's "chest". In real soccer, we can trap the ball with our chest. Similarly, an agent gets to be able to trap a ball with his chest.

We believe that these features will make the current 3D soccer simulation more interesting and exciting.

References

1. RoboCup Official Web Page. http://www.robocup.org/