UI-AI 2007 Development Team Description Paper

Saeid Akhavan, Mohammad Babaeizadeh, Hamid Reza Hasani,
Arefeh Kazemi, Hoda Safaeipour, Mohammad Sheykholeslam,
Hedayat Vatankhah, Zahra Zojaji, and Zainab Zolaktaf
http://eng.ui.ac.ir/uisim

Computer Engineering Department, University of Isfahan,
81745 Isfahan, Iran
ui_3dsoccer@eng.ui.ac.ir

Abstract. UI-AI was one of the first teams that participated in the RoboCup 3D Development competitions first year in Portugal. The 3D soccer simulation environment[1] has introduced a new test bed for creating and simulating 3D soccer teams. Team agents are based on the new 3D simulator. Part of UI-AI's scientific project goals are based on helping the RoboCup community to develop a stable and more detailed server for the next competitions. UI-AI 3D Development team has focused on both humanoid simulator and visual modules of the new 3D server.

1 Introduction

The new 3D simulation server is in its starting days of development. Therefore it is necessary to add some details to its technical and visual settings. It also needs more time to have it completely tested by the community. Bug reports and testing creates the stability in this server as it is needed in the RoboCup competitions. UI-AI3D 2007 development team's main efforts has been concentrated on the development and improvement of simspark visualization. The team has also developed a few features for the enhancement of the Humanoid simulators.

2 Developments Architecture

Using multiple layers in team structure, will make us capable of decomposing the very complex task of playing soccer into several simpler subtasks. Therefore UI-AI2007 team structure consists of three hierarchical layers which implement different levels of abstraction. The phases are as follows:

2.1 Technical Development

Calculation And Representation Of The Agent Center Of Mass currently one of the technical features we have implemented is the calculation and representation of the agents center of mass which is an essential parameter in keeping the agents balance. This feature will probably help teams control their agents motion.

Fig. 1. Center of mass of the agent has been shown by an sphere

More Reliable Size Of The World Objects Another added feature is the changes made in the size of some objects such as agent head,flag height,goal height and the side walls in the field to reach a more reliable one.

although it is shown as a sphere round the point,it will be replaced with a three dimensional representation.

2.2 Visual Development

We have tried to create a more detailed monitor with new 3D details.

New Functional Keys and Monitor Texts Some functional keys are added to the server. The monitor shows the agent center of mass by pressing g.For easier control of the monitor, some keyboard functionalities are added to move its camera in the left and right directions using i and j keys.

Ground, Players and Object Textures We have added some ground, ball and players textures to the monitor. Advertisements have also been added around the field.
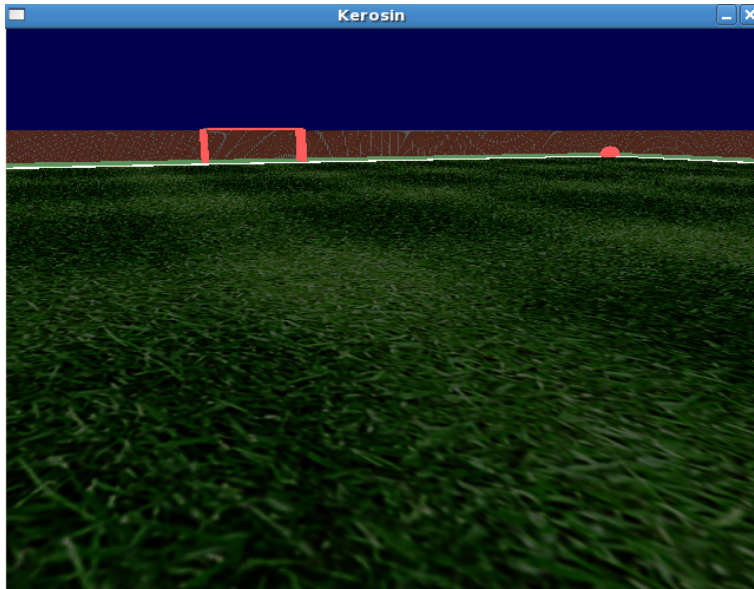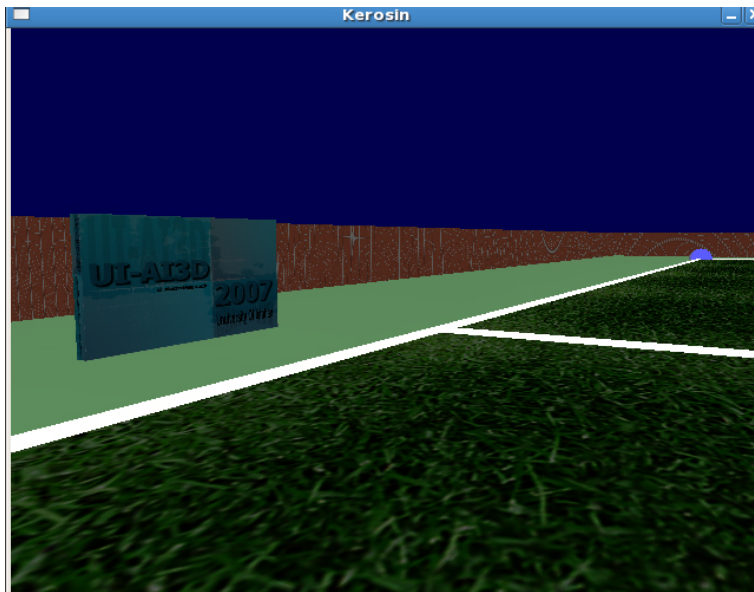
Fig. 2. Soccer field with new textures

Fig. 3. Advertisement board

3 Conclusion and Future Works

Due to the limited available time we've had for the development of the soccer simulator environment,the team has mainly tried to familiarize and adjust itself with the new server. In the three weeks since the release of the new server , the basic features that were described above, have been implemented. For our future works we intend to implement tools that enable developers to better control and analyze their agent. To this end an auto-cam will be implemented, which follows the agents or ball movement on the screen. We will try to control the agents joints through the use of the monitor and connected peripherals to the computer. A logplayer will also be implemented , so that developers will be able to evaluate their teams performance by replaying logs. We will implement a touch sensor to the agents foot so that it can have better sensations regarding its status in the field. The team also intends to improve the current appearance of the stadium, so that it resembles a real stadium. This improvement will include adding fancy light ,sound effects and etc.

References

1. Katic D, Vukobratovic M: Control Algorithm for Humanoid Walking Based on Fuzzy Reinforcement Learning.
2. Parseghian A: Control of a Simulated, Three-Dimensional Biped Robot to Initiate Walking, Continue Walking, Rock Side-to-Side, and Balance.
3. Stone P: Layered Learning in Multi-agent Systems.
4. De Boer R, Kok J: The Incremental Development of a Synthetic Multi-Agent System: The UvA Trilearn 2001 Robotic Soccer Simulation Team
5. Rutkowska D: Neuro-Fuzzy Architectures and Hybrid Learning
6. Nishiwaki K, et al: Online Generation of humanoid Walking Motion based on a Fast Generation Method of Motion Pattern That Follows Desired ZMP
7. Cuevas E, Zaldivar D, Rojas R: Bipedal Robot Description, Technical Report