CyberSession: A New Proposition for E-Learning in Collaborative Virtual Environments

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ABSTRACT

E-Learning in fact is another type of learning process through the integration of technology and is perceived as learning via a web browser, over the web or an intranet network. E-Learning in the context of 3D virtual environments promises better performance in the light of new trends for 3D environments among users.

This paper presents the design and first steps to the implementation of a collaborative environment representing course materials through web3D technologies. It highlights the unique ability to run in low bandwidth by simulating user input and transforming work forces into a knowledge resource. In our framework, nicknamed *CyberSession*, users can switch between 2D and 3D environments to support synchronous training, asynchronous training and collaborative training systems.

Keywords
E-Learning, Collaborative Virtual Environments, Social awareness, Avatars

1. INTRODUCTION
Today, with promotion of computer based training and electronic learning methods, many universities and research institutes invest in virtual classrooms. E-Learning is a popular term and has various extensions such as Online learning, Web-based training (WBT), Web-based learning and technology based training (TBT) and Computer-based training (CBT).

As innovation accelerates, training programs must become more flexible and less time consuming. However 70% of people never finish WBT systems because of the lack of a social contact. Using collaborative WBT system we have access to an updateable real-time interactive content alongside virtual social awareness [Gut 95]. Collaborative interactive learning is a memorable experience. Questions are answered immediately in lively discussions. Learning in groups makes the course fun and ensures a supportive atmosphere [Bla04].

In this paper we present our proposition nicknamed CyberSession to overcome the current problems of multimedia classes and bring better performance to e-learning methods and discuss the lessons we have learned from our experiences.

2. CYBERSESSION TESTBED
In CyberSession there exists only a Server program that is responsible for transformation of messages between client programs. According to the current design, the server program must be executed on a single computer and it has the following capabilities:

Specifications of the system
1) Definition of minimum online users

2) The ability of changing the teacher (without changing people from behind of computer)

3) The ability of saving a session and re-execution of it without presence of teacher

4) The ability of holding an exam (in this case each workstation works stand-alone)

5) It is to a high extent independent of the program being taught

6) Support of UDP or TCP communication

7) Sharing one or multiple files

CyberSession is implemented as a case study on a LAN and its performance is tested. In CyberSession instead of sending all of the display to computers of class members, only events of keyboard and mouse is transferred to computers of the cyber class.

3. CYBERSESSION ARCHITECTURE IN COLLABORATIVE VIRTUAL ENVIRONMNETS (CVE)

In our new architecture we have conceived all useful appliances in a cyber class room. The functionalities that are supported in this way are: **Communication between attendees, Social awareness, Avatar simulator, Billboard simulator, Class administration** [Bou01].

The architecture of our system is dictated in Figure 1. The teacher's computer will send two different messages to the Server that are indicated in the diagram with (a) and (b).
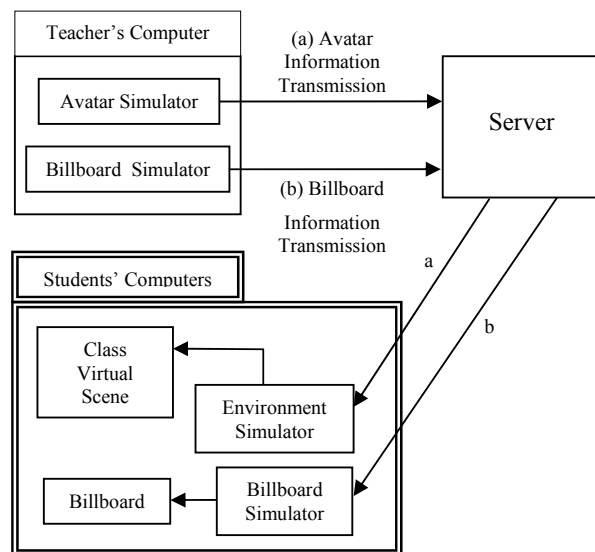

Figure 1. CyberSession Architecture

The (a) type messages contain the teacher avatar movements while in (b) type messages information related to billboard changes will be sent to the Server. The students will receive two messages (a) and (b) from the server that are the messages from the teacher's computer.

4. EVALUATION

E-Learning methods on Internet generally reduce training costs dramatically and increase the productivity of trainers since they have access to learning contents.

Main benefits of our approach

1) Low price in contrast with current costs of multimedia classes.

2) Ability of practical representation of course with all details.

3) Ability of requesting any student at any point of the course representation to continue the job.

4) Possibility for practical evaluation of students.

5) Students may ask questions/interact with the teacher's permission.

6) Actual physical location for course representation is unnecessary.

7) Ability of streaming the voices of the teacher to students, student to teacher and student to students with suitable performance depending on available bandwidth.

8) Ability of saving and re-representing course sessions for review or re-use with low volume, low price and without loss of quality.

9) Ability of offline representation of saved courses (without need for the presence of teacher).

5. CONCLUSION

In our current system users will attend in a fully interactive class and with low cost of communication can access to huge amount of information.

Our main future trend is implementation of the CVE version of CyberSession with the design reported in this paper. We are also in the middle way of negotiation with Blaxxun Technologies GmbH to use their Blaxxun Platform as a container for CyberSession project.

6. REFERENCES

[Bou01] Bouras, C., Hornig, G., Triantafillou, V. and Tsiatsos, T. *"Architectures Supporting e-Learning Through Collaborative Virtual Environments: The Case of INVITE",* In Proceedings of IEEE International Conference on Advanced Learning Technologies-ICALT 2001, Madison, Wisconsin, USA, August 6-8, 2001, pp. 13-16.

[Gut95] Gutwin, C., Stark, G. and Greenberg, S. *"Support for Workspace Awareness in Educational Groupware".* Pro ACM Conference on Computer Supported Collaborative Learning, Indiana University, Bloomington, Indiana, USA October 17-20, 1995, pp 147-156.

[Bla04] Blaxxun Technologies GmbH, http://www.blaxxun.com, 2004