Created on 2 déc. 2012

Project Learning in 3D Virtual Worlds, enabling vAcademia in CAVE

Project overview

Title :	Learning in 3D Virtual Worlds, enabling vAcademia in CAVE
Main field :	Virtual reality
Motivation and objectives :	General motivation: Virtual Reality and Three-dimensional Virtual Worlds have a number of unique advantages in supporting a variety of activities and their use has been continuously increasing in recent years.They have also become more widespread as a technology for learning despite many challenges. A number of studies have been done in this area outlining advantages and limitations of these technologies as learning environments. As stated in recent surveys, the use of these technologies as learning environments is a new emerging trend and still under development. This fact motivates further research in the area. Specific motivation: Enabling the Educational 3D Virtual World vAcademia to work with the CAVE facility may allow to extend the application domain of both systems and open additional possibilities. A study or a research project may be conducted aiming at exploring these possibilities and defining requirements for deploying the system into practice. The main objective of the project is to explore the possibilities of an educational virtual world accessed through a CAVE interface.
Research questions :	RQ1. How does CAVE works and what are the affordances of this technology for learning? RQ2. How to use an educational Virtual World platform in CAVE? What are the benefits and challenges? RQ3. Which learning methods and scenarios are best suitable for an educational Virtual World platform in CAVE?

Research context

State of the art :	Virtual Reality environments have been attracting attention of educators and researchers since their appearance. This type technology provides a unique set of features that can be used for educational purposes, such as low cost and high safety, three-dimensional representation of learners and objects, interaction in simulated contexts with high immersion and a sense of presence. Possibilities for synchronous communication and interaction allow using 3D Virtual Worlds by various collaborative learning approaches. In addition, possibilities for simulating environments on demand and for active collaborative work on the content allow applying situated learning and project-based learning approaches. Exploiting advantages of the content manipulation, 3D Virtual Worlds can be used as cost -effective prototyping platforms to build and evaluate models or realistic simulations of existing or planned spaces. Many types of Virtual Reality technologies can be well used as information visualization environments, immersing users and providing them with rich sensory experience. In addition, these technologies are used for educational simulations and demonstrating complex concepts. Despite the repeated positive conclusions, researchers often report that their studies have experimental nature.

Scientific challenges :	General challenges: high cost of CAVE facilities, lack of specific scenarios for applying both CAVE and 3D Virtual Worlds for learning, lack of standards, lack of integrated software systems. Specific challenge: porting vAcademia virtual world to the CAVE facility, developing a prototype (or identifying what is required)
Scientific merits :	General merits: many types of advanced audio-visual interfaces are used in training, simulations, and collaborative work. More types of interfaces and interaction with the involvement of other senses are being developed or tested. Specific merits: vAcadmeia virtual world has some specific educational tools and features, and as the project is in beta and the architecture is flexible, it is possible to experiment with the interfaces, including the CAVE.
Ethics and confidential issues :	

Facility description

Specified facilities :	UCL-VRLAB
Not specified facilities :	CAVE facility

Work plan

Operational work description :	I am planning to learn how both systems (the CAVE facility and vAcademia) work and understand what is required to make them work together in order to facilitate collaboration between the vAcademia main development team and UCL-VRLAB CAVE support team.
Timing workflow :	Days 01-03: - Getting to know the people in the lab, - discussing the possibility of a study or a project based on running vAcademia VW in CAVE, - mediating the communication between the vAcademia main development team and UCL -VRLAB CAVE support team - discussing with all the stakeholders the work to be done withing the visit, taking the role of a mediator and facilitator, - trying out the CAVE facility. - If time left - learning the other facilities available in the lab and R&D projects. Days 03-09: - learn how both systems (the CAVE facility and vAcademia) work and understand what is required to make them work together - facilitate the dialog and collaboration between the vAcademia main development team and UCL-VRLAB CAVE support team

Type of Data to be used and other useful informations to speedup the evaluation of the project

Delivrables

Demonstration :	

New or improved technical visualization :	
Improved visualization / communication software :	
Conference presentation and/or publication :	
Other :	

Expected benefits form the project (scientific/training)

The main benefit (or rather outcome) from the project will be the development of an interface between the Educational 3D Virtual World vAcademia and the UCL VRLAB CAVE facility. Such a system can be utilized in applying and further researching the application of Virtual Reality for learning. It may open a possibility for a study or a research project proposal. The implications from the project may be useful for developing interfaces between any 3D Virtual World and CAVE.
Additional outcomes include establishing a good contact between three organizations involved in the project and gaining practical knowledge on developing and applying advanced VR interfaces.

Biographical data of the proposer

Mikhail Fominykh was born in Russia in 1984. He received a specialist degree (5 years) from the Computer Science department at the Volga State University of Technology (former Mari State Technical University), Russia in 2006. From 2007 to 2012 he had been holding a PHD research fellow position at the Faculty of Social Sciences and Technology Management, Norwegian University of Scince and Technology (NTNU) and studying as a PHD candidate at the Faculty of Information Technology, Mathematics and Electrical Engineering, NTNU. He has defended his thesis under the title “Collaborative Work on 3D Educational Content” in April 2012. Since August 2012, he is working as a postdoctoral research fellow at NTNU.

Five major publications

1. Mikhail Morozov, Alexey Gerasimov and Mikhail Fominykh: "vAcademia – Educational Virtual World with 3D Recording," in Arjan Kuijper and Alexei Sourin ed. the 12th International Conference on Cyberworlds (CW), Darmstadt, Germany, September 25–27, 2012, IEEE, ISBN: 978-0-7695-4814-2/12, pp. 199–206. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6337420
2. Mikhail Fominykh and Ekaterina Prasolova-Førland: "Educational Visualizations in 3D Collaborative Virtual Environments: a Methodology," International Journal of Interactive Technology and Smart Education (ITSE), Volume 9, issue 1, 2012, Emerald, ISSN: 1741-5659, pp. 33–45. http://www.emeraldinsight.com/journals.htm?articleid=17026686&show=abstract
3. Mikhail Fominykh and Ekaterina Prasolova-Førland: "Virtual Research Arena: Presenting Research in 3D Virtual Environments," in the 2nd Global Conference on Learning and Technology (Global Learn Asia Pacific), Melbourne, Australia, March 28–April 1, 2011, Chesapeake, VA: AACE, ISBN: 1-880094-79-7, pp. 1558–1567. http://www.editlib.org/p/37372
4. Ekaterina Prasolova-Førland, Mikhail Fominykh, Ramin Darisiro and Anders I. Mørch: "Training Cultural Awareness in Military Operations in a Virtual Afghan Village: A Methodology for Scenario Development," in the 46th Hawaii International Conference on System Sciences (HICSS), Wailea, HI, USA, January 7–10, 2013, IEEE, in press.
5. Mikhail Fominykh, Monica Divitini and Ekaterina Prasolova-Førland: "Supporting Collaborative Creativity with Educational Visualizations in 3D Virtual Worlds," in the 1st International Workshop on Creative Collaboration through Supportive Technologies in Education (CCSTED), the 11th International Conference on Web-based Learning (ICWL), Sinaia, Romania, September 2–4, 2012, Springer - in press.

Personal data

Name :	Postdoc Mikhail Fominykh Mikhail
Organization name :	Norwegian University of Sceince and Technology
Organization address :	Sem Sælands vei 7-9, NO-7491 Trondheim Norway
Email :	mikhail.fominykh@svt.ntnu.no
Phone :	+4748603627
Mobile phone :	+4748603627
Video conference system :	Skype pseudo : null

Description of the proposing group

Organization short description :	The Norwegian University of Science and Technology (NTNU) is Norway’s primary institution for educating the nation's future engineers and scientists. The university also has strong programmes in the social sciences, teacher education, the arts and humanities, medicine, architecture and fine art. NTNU's cross-disciplinary research delivers creative innovations that have far-reaching social and economic impact.

Proposing group short description :	Program for Learning with ICT (LIKT) is a cross disciplinary program, a meeting place between a variety of scientific areas, ranging from ICT to the social sciences, where pedagogic and didactic traditions are of particular relevance. The research focus is currently on mobile and ubiquitous learning, collaborative learning environments and 3D learning environments.
Scientific background :	LIKT takes part in a NFR financed research program, FABULA, that involves three different departments. The program also takes part in research projects under EU FP7, TARGET, MIRROR, and CoCreat. TARGET involves collaboration with SINTEF, international industry partners (Nokia and Siemens) and major international technical universities. LIKT constructed a Virtual Campus of NTNU to serve as an arena for educational activities and as a resource for students and teachers of NTNU. LIKT has also been involved in an EU project Travel in Europe, which resulted in the virtual reconstruction of the most prominent buildings in the city of Trondheim.
Web site :	http://www.ntnu.no/ikt/english/learning