Second Life – a Virtual Learning Environment

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Abstract
A continuous concern in education field is to discover new technologies and methodologies in order to increase the quality of intellectual capital. In present, virtual technology expends learning opportunities and draws many participants. Software agents are met not only in real life, but also in virtual reality. Second Life environment enables its users to create/design intelligent software agents (called avatars) that may interact. To these avatars, there may be attributed certain behaviors by means of an adequate Second Life language, called LSL (Linden Script Language). Avatar-based virtual world education is highly interactive comparing to distance learning and providing the same convenience of not having to travel while providing a more effective and more enjoyable experience. In this paper, the authors describe Second Life virtual life environment and illustrates LSL’s use on a robot called RoLyvEdu acting in a virtual classroom.

Keywords: Second Life, agent technology, virtual learning environment

Introduction
The education environment is changing simultaneously with technological trends. New pedagogical methods appear, new resources are available and new experiences are made. An ongoing concern in education field is to discover new technologies and methodologies in order to increase the quality of knowledge.

The continuing growth in the amount of computing power, the widespread availability of 3D graphics software and the development of natural language processing are considered the main factors responsible for rising to the new area called intelligent virtual environments.

The use of virtual environments for training is an option for educational activities to cover the learning process in those situations where traditional pedagogical methods are not convenient. These environments allow the students to navigate through and interact with a virtual representation of a real environment in which they have a certain job. Virtual characters representing the tutoring component of virtual environment are known as pedagogic agents, designed as intelligent software agents.

In this paper, the authors describe Second Life virtual life environment and illustrates Linden Script Language (LSL) (Moore, 2008) use on a robot called RoLyvEdu acting in a virtual classroom.

Second Life
Second Life (Rymaszewski, 2008), is a 3D online virtual world developed by Linden Lab (since 2003) and allows registered users (called Residents) to fulfill several social activities and interactions, events, games, electronic commerce, collaborations, education etc.

Second Life provides significant tools for parting and designing multimedia content, streaming included, some of the most frequent uses being e-business, e-learning, virtual events planning,
simulations of various types, social games etc. Some important services developed by Second Life are: Teen Second Life, Second Life Library 2.0, New Media Consortium Campus, Exploratorium’s SPLO Museum (Wiki, 2009).

Avatars (the intelligent software agents) may take any form users choose (human, animal, vegetable etc.) and can communicate via local chat, group chat, global instant messaging (known as IM), and voice (fig.1).

Second Life is used as a platform for education by many institutions, such as universities, libraries and government entities and continuous gains popularity (Second Life, 2011):
- ECU Early College Second Life Program - The Early College Second Life Program (ECSLP) provides rigorous coursework, including science, technology, engineering, and math, using a variety of Web 2.0 technologies.
- University of Southern Denmark - Second Life campus of the University of Southern Denmark;
- Indiana University Second Life Campus;
- NUS - virtual campus designed, built, and operated entirely by students and faculty from the National University of Singapore to enable learning, teaching, sharing, and social interaction;
- Volkshochschule - Germany's large education institute;
- Open University - the Open University was the world's first distance learning institution. It still offers courses and adult education to people everywhere via BBC television, the Internet, and Second Life;
- The University of Western Australia – the Second Life campus of the University of Western Australia, a place for teaching, research, art and architecture;
- Stanford University - a virtual library developed by Stanford University's Libraries and Academic Information Resources (SULAIR);
- Harvard Law School - the Berkman Center for Internet & Society at Harvard Law School has held multiple classes within Second Life.

Also, Second Life gives companies the option to create virtual workplaces to allow employees to virtually meet, hold events, practice any kind of corporate communications, conduct training sessions in a virtual learning environment, simulate business processes, and prototype new products (Wikipedia, 2011).

In Romania an experts team developed Virtual Bucharest, the virtual replica of the city center and as a future projects are mentioned The Bran Castle, The Danube Delta, followed by the cities Brasov, Timisoara and Constanța.

In the next section the authors present the designing of a robot in Second Life and the associated scripts using Linden Script Language (LSL).

**Building a robot in Second Life**

The avatar designed by authors is called RoLyvEdu and belongs to the virtual environment Second Life. The user can control objects and avatar behaviors using LSL, an internal, even-driven, C/Java-style language (Moore, 2008).
A script represents an item that contains instructions associated to avatars. A script is organized into states and functions. States consist of a series of events and each object may have as many scripts on it as memory allows. Usually, scripts have a length limit.

The main steps to create a new script in LSL are:
- selecting the object to whom a script is about to be attached;
- editing the body of the script by going to the "Content" tab of the object's "Edit" box and clicking the "New Script..." button. The script editor appears with the example script and the user can add his own code.

The text of the script is compiled into an executable byte code, similar to Java. Then the resulted byte code runs within a virtual machine on the simulator. Each script receives a time slice of the total simulator time allocated to scripts. Each script executes within its own chunk of memory, preventing scripts from writing into protected simulator memory or into other scripts, making it much harder for scripts to crash the simulator (Dashboard, Internet2 Wiki, 2009).

The figure 2 refers to the script editor which allows writing the code for avatar behavior.

The following scripts are attached to RoLyvEdu:
- “Cine esti” – displays the name of the robot wherever in the chat window one types the text “Who are you?”;
- “Orientat_spre_avatar” – orients the object to the avatar;
- “Salut” – displays a greeting message;
- “Schimba_culoarea” – changes the robot’s color at every 2 seconds;
- “site_web” – displays a connection/ link to the owner’s personal page whenever in the chat window one types “RoLyvEdu?”;

In figure 3 are presented several examples of scripts written in LSL and associated to RoLyvEdu.
The designed avatar can participate to learning process into the virtual classroom every time the user is connected to the virtual environment (fig.4).

![Fig.4. The virtual classroom](image)

Some benefits of using virtual learning environment are mentioned as following (Alvarez, 2006, Coffman, 2007):
- the three-dimensional virtual world makes it possible for students taking a distance course to develop a real sense of community;
- students interact with each other as well as into college campus;
- various class-related events are open to all registered users;
- virtual worlds also kept the students engaged with technology.

As a conclusion, virtual learning environment could be a valuable teaching tool in any classroom.

References

Books:

Journal Articles:

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http://secondlife.com/destinations/learning

Computer Programs:
Second Life