SLACTIONS 2011

RESEARCH CONFERENCE IN THE SECOND LIFE® WORLD

LIFE, IMAGINATION, AND WORK USING METAVERSE PLATFORMS

Conference Proceedings

Editor: David Kurt Herold

November 18th, 2011
HKPolyU Campus, Lecture Theatre

SLACTIONS 2011 RESEARCH CONFERENCE, Lecture Theatre, HKPolyU Campus, Second Life

SLACTIONS 2011 Research Conference: Life, imagination, and work using metaverse platforms: Proceedings of the... / edited by David Kurt Herold.

ISBN: 978-988-16411-2-0

Published by

CoreSL – HK PolyU in Second Life
Department of Applied Social Sciences (APSS),
HK Polytechnic University,
Hung Hom, Kowloon,
Hong Kong

Proceedings of the SLACTIONS 2011 Research Conference

—

Life, imagination, and work using metaverse platforms

—

November 18th, 2011
HKPolyU Campus, Lecture Theatre

Local Chapters (alphabetically)

HK Polytechnic University, Hong Kong (Chair: David Kurt Herold)

Pontifícia Universidade Católica de São Paulo, Brazil (Chair: Donizetti Louro)

Rey Juan Carlos University, Madrid, Spain (Chair: Teresa C. Rodriguez)

Universidad de San Martin de Porres, Lima, Peru (Chair: Frank Casas Sulca)

University of Tras-os-Montes e Alto Douro, Portugal (Chair: Leonel Morgado)

Contents

Foreword

David Kurt Herold, HK Polytechnic University

Human beings engage with virtual worlds on a daily basis. They are used and entered to support such diverse activities as business meetings, scientific simulations, inter-personal communications, design projects, psychiatric counselling, etc. In universities, virtual worlds are used for learning, researching, teaching, exhibiting, sharing, etc. Even the organisation of workshops or conferences is nothing new.

Yet, the organisation of SLACTIONS 2011 proved challenging on many additional levels, as the conference – like its predecessors – involved more than 'just' a meeting between skilled individuals in an online 3D environment:

- An organising chapter that ceased to exist halfway through the preparations;
- Cross-cultural (mis-)communication between non-native speakers of English;
- Local chapters with very different technical setups and requirements;
- Coordination of offline events in five different timezones with the online conference;
- Incompatibilities of local sound and video equipment;
- A rolling re-start by LindenLab of the region in which the conference took place;
- …

SLACTIONS is a unique experience for those taking part in it, and despite some of the challenges this year's conference had to overcome, it is to be hoped that these annual conferences will continue for a long time.

Papers Presented

Effectiveness of virtual world timers in educational physics simulations

Jorge Lima
ECT/UTAD – University of Trás-os-Montes e Alto Douro, Vila Real, Portugal, jlima@utad.pt

Leonel Morgado, Benjamim Fonseca, Paulo Martins, Hugo Paredes
GECAD/UTAD – University of Trás-os-Montes e Alto Douro, Vila Real, Portugal, {leonelm, benjaf, pmartins, hparedes}@utad.pt

Abstract

In this essay we will present a Physics education project developed in virtual worlds. After prototyping in Second Life, it was decided to port it to its free-software alternative, OpenSim. Several challenges were encountered, namely the ability of sampling an object's position and velocity more than twice per second. This performance was unacceptable for our project, which motivated a deeper study of timer effectiveness in virtual worlds, including also ScienceSim. Results indicate that only Second Life can support effective timers able to supply Physics simulations with more than two samples per second.

Introduction

The Physics education project at hand was initially developed in the Second Life virtual world, for its ability to simulate gravity and collision detection between complex objects, without any effort on our side. We intended to develop several physics simulations based on gravity, such as Newton tubes, projectiles, and parachutes.

The term "virtual world" has been applied to a vast range of environments that can provide their users with creative freedom, through built-in tools for developing and sharing content [1]. As an example of this diversity, we can present several two-dimensional worlds (WorldsAway, Habitat, The Palace), three-dimensional ones (ActiveWorlds, Second Life), isometric (also known as 2.5D) (Furcadia, Habbo Hotel), and even text-based, if we retrospectively apply the term to its predecessor (MUD). Virtual worlds differentiate themselves by offering usability [2], socialization, and collaboration [3]. In a virtual world users can experience a physical, persistent, shared, interactive, remotely accessible environment, which provides an immersive experience [4]. User can convey their identity to others through the use of customizable "avatars" [5], a term that appears in Hindu mythology as the representation of a god on Earth.

We shall restrict the term "virtual world" to platforms that support rapid collaborative development and enjoyment of interactive 3D content, that support physics simulations such as ours, in a shared social space where students and teachers can exchange ideas, with access control features to let educators decide by whom and how the software will be used, using client-server architecture, so as to enable students to remotely access the educational activities.

A well-known example of such a platform is Second Life, which, after having gained significant media exposure, was adopted as a development tool for business and educational projects [6]. Its nature as a privately-hosted, costly platform eventually led to the development of compatible alternatives, OpenSimulator and ScienceSim being amongst the most used.
OpenSimulator was developed according to the "free software" philosophy according to which any person may contribute to its development [7]. ScienceSim, while based on the OpenSimulator source, has the advantage of being sponsored by Intel and 3Di [8], and their significant programming resources. Their goal is to maintain a separate version of OpenSimulator and correct some issues with it. [9]. Nowadays, the educational sector makes extensive use of these platforms, producing an increasing amount of studies and projects [10].

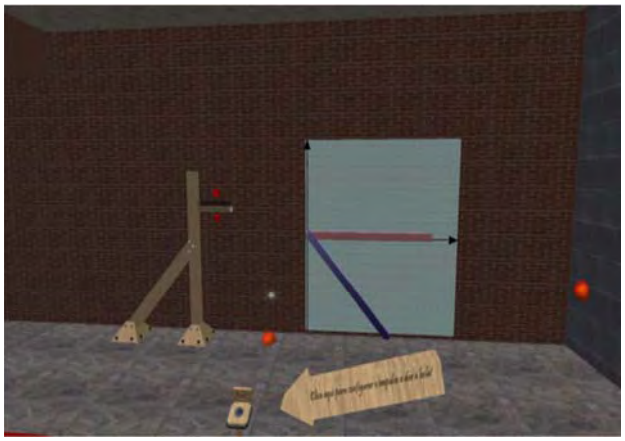
Background

Virtual worlds enable the development of a vast array of projects. Using Second Life incurs steep costs, which makes the search for viable alternatives ever more appealing, as their development matures and stabilizes. Even though there is no licensing fee, there may still be hardware, hosting and maintenance costs associated with using your own server. The choice of platform depends on the type of project. In order to contextualize these choices and the results obtained in this study, we must analyze a specific case - a physics education project. All virtual worlds that meet our aforementioned definition allow physics simulation, facilitating the implementation of small experimental activities. These enable autonomous learning by students that can remotely access the server to study various parts of the syllabus, or even solely in the formal context of a classroom, by using access control features. Since virtual worlds also exhibit collaborative capabilities, it is possible to use them as a tool to support group assignments. We shall present a clear example of one such incompatibility and its

substantial impact on this project. However, even though these virtual worlds aim to be compatible, some differences still exist which will be the subject of our research.

The context: Physics Education

This study arose from the development of an eLearning solution for physics education based on virtual world technology. Specifically, in order to explore the differences between all three platforms, the development of a simple case was attempted: a ball rolling down a diagonal chute. The configurable variables were the ball's initial position relative to the chute, and the chute's distance to the ground, with the end goal of measuring the ball's velocity upon leaving the chute, registering its point of impact on the ground, and drawing graphs for the velocity vector's X and Y components.



Picture 1 – the chute experiment

Materials

The test computer used was an Intel Core2 4300 at 1.8 gigahertz, with 3 gigabytes of RAM. Tests were executed in OpenSimulator version 0.7.0.2 running under Windows XP SP3. The OpenSimulator server was empty aside from the test script, and used the default configuration. We accessed the server by running a graphical client on the same machine (Hippo OpenSim Viewer) as well as a lightweight text-only one (Radegast). All programs were closed except for vital windows tasks, and Task Manager was used to set execution priority to Low on everything but the server, which was set to High. It was not possible to obtain this information about the Second Life and ScienceSim servers, since they are not hosted by us.

Method

Mathematical analysis – solving equations – is even harder for computers than it is for humans, which leads to an alternate approach: Simulation, approximating a smooth curve through periodical calculation of points.

This is an entirely valid and widely-used approach[12], especially if we consider that Physics itself has recently produced results that, according to some, may indicate the Universe itself is composed of points of space and time like a computer simulation [13][14].

In Physics, the unit of frequency is the Hertz, defined as one cycle per second [11], of which megahertz and gigahertz are multiples. If we increase frequency we can produce more samples in the same period of time, which brings our set of points closer to the original curve. This increase in Hertz may lead some to believe that computers with more Hertz are always faster, but this is not always true, there are more factors to consider, such as software efficiency.

The word "**algorithm**" is the method with which we solve a problem[15], and can be classified into different orders of magnitude of efficiency with a mathematical construct dating back to 1892: the "**big-O**" notation.[16] If we have one any N number of things to buy, and go to the supermarket N times to buy one at a time. This order of magnitude is represented as O(N), whereas taking only one trip would be represented as O(1). Using O(N) methods where O(1) is possible, divides computing power by N.

Humans can only get everything in one trip depending on how much load they can carry. Beyond this limit they will still divide their purchases into N trips. Algorithms also have load limits, and much like water suffers a phase transition to ice at 0ºC, they can suffer a phase transition after their limits.[17] We can expand the load limit for humans with a car, but only N items will fit in your trunk, after which you will still have to divide your shopping list into N trips – when the algorithm is inefficient, upgrading hardware makes little difference. The computer equivalent would be memory, and a program limited by memory would be **memory-bound**, but algorithms can also be bound by the CPU's processing power or Input / Output transfer speeds.

There is also the matter of time. We could drive across Europe, or all the way to Asia, but perhaps we would need to get there faster by catching a plane. Driving would not be **effective** for researchers that need to attend conferences in different countries scattered all over the world (and be back in the lab as soon as possible).

Similarly, Physics simulation projects have special requirements: Precise, timely, deterministic calculations of periodic phenomena.

We define **effectiveness** as the ratio of observed to ideal behavior, executing a number of samples in the requested amount of time.

Timers are mechanisms used by operating systems to schedule periodic tasks. The number of tasks we can schedule, how they are sorted, and how fast they can be processed depends on the scheduler.[21] Task scheduling is itself a challenge which has been studied for a long time, and is still an active research field. Many algorithms exist that schedule tasks with different efficiency, effective for different purposes.[18] [19] [20]

If we set up a timer to take a sample ten times per second, during ten seconds, an effective timer would have taken ten samples after one second had past, twenty after two seconds, and a hundred in total.

This would be an ideal timer, 100% efficient and very effective for our project, with no deviation from the specified behavior.

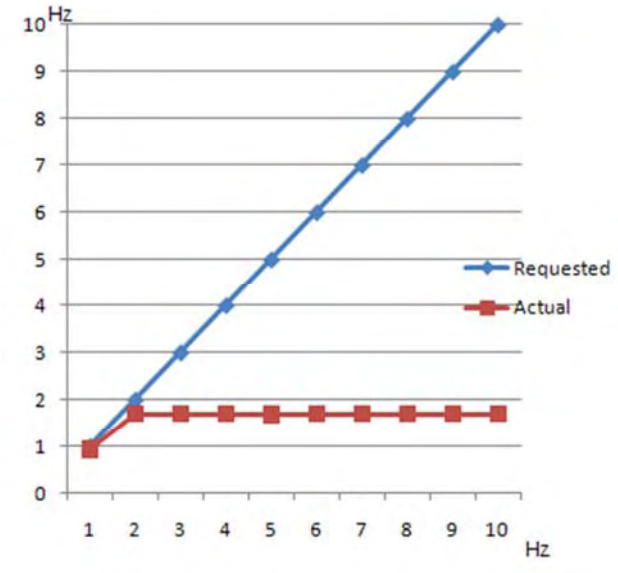
Even with 2001 computing resources, a timer running under the UNIX operating system was able to get responses from a Web Server in 2 to 18 microseconds, which would correspond to a response frequency of 2 to 18 megahertz. [23]

This would be an extremely effective timer for our project, far more than we need, if we consider that the PAL standard used by televisions updates the screen at 60Hz. [22]

Let's see how this compares to virtual worlds.

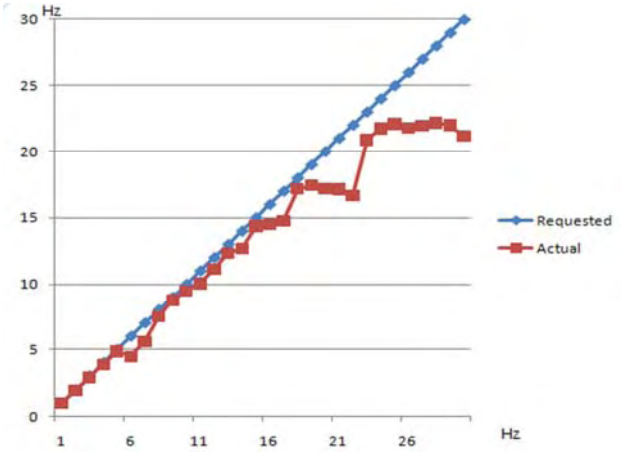
Results – Virtual World Timers

We will now compare two sets of data collected, one for OpenSim, the other for Second Life. We ran the standard built-in timers with an automated test that gradually tried to increase the sampling rate. In the case of OpenSim, we ran it from 1Hz to 10Hz, which was the originally intended performance.



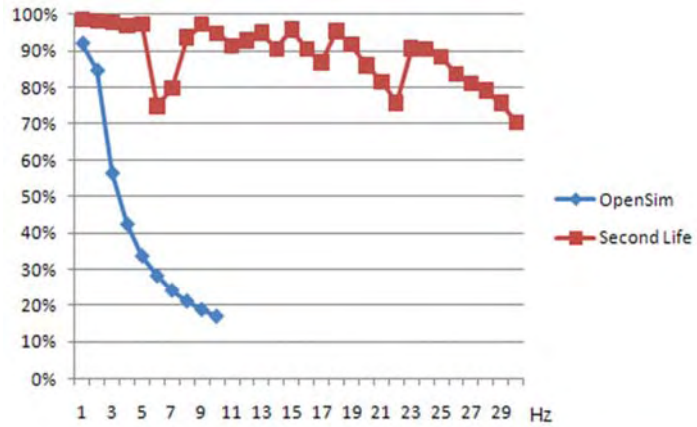
Graph 1 – OpenSim performance

With Second Life sampling, it became clear that it would not converge as quickly. There were many fluctuations – we were not able to obtain a perfectly isolated test environment, so many variables were not controlled for. Nevertheless, results clearly show that it is possible to obtain higher performance, for more frequent sampling, resulting in more points of data and solid physics results.



Graph 2 – Second Life performance

In order to provide a better picture of compared efficiency, we took the previous data and divided actual performance by ideal performance. This ratio, as a percentage, is depicted below:



Graph 3 – Comparison of OpenSim and Second Life

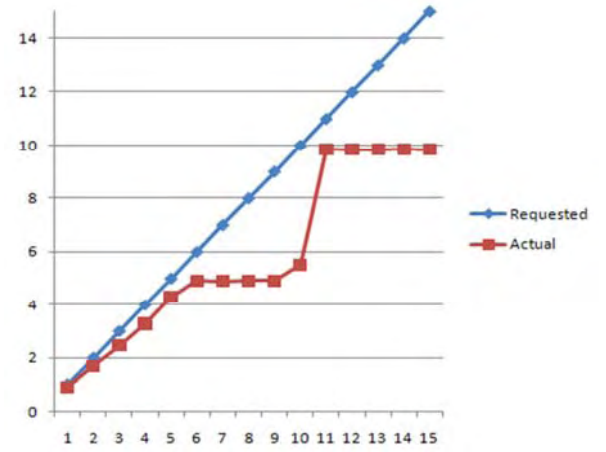
Unconventional timers

Though standard programming practices encourage us to implement our own solution in the absence of a viable one, this is hardly ever possible in the virtual worlds we used, since they are designed to merely react to events inside them, not supporting standard language mechanisms such as external function libraries. The only way to modularize code is by sending messages to scripts running in parallel. However, while processing an event, the system will not be able to receive any more, and this includes all kinds of messaging. They are handled on a first-come first-serve basis, and there are limits to how many can wait in the queue. After a very long time, we nevertheless attempted to implement our own timers using very simple code:

```
while(--numSamples > 0)
{
  llSleep(1/samplingRate);
  doSomethingPeriodically();
}
```

There are many drawbacks to this implementation. It consumes all available CPU, and for our dual core test computer, only 2 sampling scripts can be run simultaneously without overloading the computer. Preliminary testing demonstrated a reliability of 99% between 2 and 30Hz. We hypothesize that an undocumented issue with the llSleep function could be preventing us from executing slower or faster, since execution can sometimes fail silently outside these sampling rates. Further examination will be required.

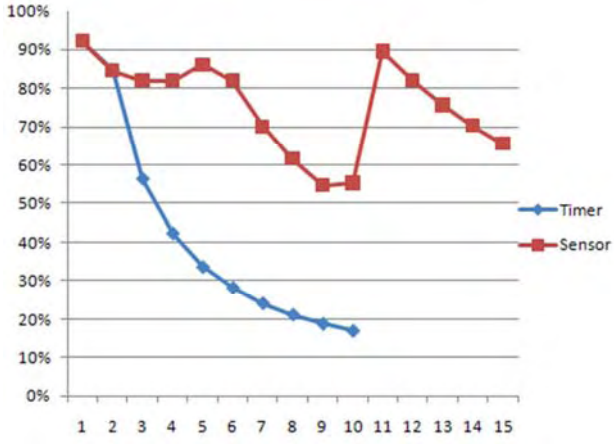
llSensorRepeat can detect data in the surrounding environment on a regular basis. We also implemented a timer by ignoring any returned data, though care must be taken to supply it with the correct input. Our results, shown below, indicate a sudden shift in behavior around 10-11Hz, to which we must adjust.



Graph 4 – Sensor-based timer sampling

Unlike Second Life, we were fully in control of the server this time, and care was taken to prevent interference, as described in Materials and Method.

We don't have, at present, a solid explanation for this phenomenon. A closer inspection of the source code could reveal its cause, as well as further testing under an operating system with real-time guarantees such as RTAI or RT-Linux.



Graph 5 – Sensor efficiency vs. Timer

As we can see from this table, our sensors are indeed very efficient compared to the default configuration of OpenSim.

Afterword

Upon inspection of the OpenSim source code, however, it was discovered that a hidden option, not present in the default configuration files, is preventing users from creating timers that trigger more frequently than 0.5 seconds.

```
LSL_API.cs:

protected float m_MinTimerInterval = 0.5f;
(...)
public void llSetTimerEvent(double sec)
{
if (sec != 0.0 && sec < m_MinTimerInterval)
                    sec = m_MinTimerInterval;
(...)
}
```

Changing this variable would have solved our problem, had we not adopted a completely different approach in the mean time. The phenomena we were sampling were linear in nature, therefore possible to extrapolate from one sample, producing graphs that perfectly match physics theory and thus serve their educational purpose, even if they do not represent the inner workings of the OpenSim physics engine, Open Dynamics Environment.

Conclusions

Even though compatible alternatives exist, these do not present the same functionality, usability and stability as Second Life. In the absence of financial constraints, Second Life seems to offer more guarantees. OpenSimulator in its default configuration does not support projects strongly dependent on timeliness, such as our Physics simulation, but there are many ways to work around its restrictions.

The Sensor-Timer implementation here described can be used to circumvent restrictive configurations when developing a project on a server hosted by a third party, not under our control.

It is not intended to extrapolate these conclusions to the general case of projects developed on these platforms, a lot of which do not depend on this type of functionality.

Future work

Our conclusions were drawn from a very specific type of project with specific needs. Each platform's functionality encompasses a much wider range of possibilities that could be the subject of further studies. Exploring other physics education problems could bring a deeper understanding of the differences between these platforms. It's possible there will be ways to work around these problems, and further testing is required to pinpoint their cause.

Acknowledgements

We would like to thank the physics teachers, Paula Batista and Helena Fernandes, from Escola Secundária Camilo Castelo Branco, for their guidance in this study.

References

[1] C. Ondrejka, "A Piece of Place: Modeling the Digital on the Real in Second Life", 2004

[2] D. A. Bowman, J. L. Gabbard, D. Hix, "A Survey of Usability Evaluation in Virtual Environments: Classification and Comparison of Methods", 2002

[3] S. Benford, C. Greenhalgh, T. Rodden, J. Pycock, "Collaborative Virtual Environments", Communications of the ACM July 2001/Vol. 44, No. 7

[4] E. Castronova, "Virtual Worlds" pp.2-4, 2001

[5] E. Castronova, "Virtual Worlds" pp.7-9, 2001

[6] W. A. Warr, "Social software: fun and games, or business tools?", Journal of Information Science, 2008

[7]OpenSim community, http://opensimulator.org/wiki/Main_Page ,(Accessed on 19/01/2011)

[8] ScienceSim foundation, http://www.sciencesim.com/wiki/doku.php/sponsors , (Accessed on 19/01/2011)

[9] Fundação ScienceSim, http://www.sciencesim.com/wiki/doku.php/foundation/devprocedure, (Accessed on 19/01/2011)

[10] L. Morgado, "Os mundos virtuais e o ensino-aprendizagem de procedimentos", Educação & Cultura Contemporânea, ISSN 1807-2194, 13 (6), 35-48. 2009

[11] Bureau international des poids et mesures, "Le Système international d'unités (SI), 8e édition", 2006

[12] A. Law et al, Simulation Modeling and Analysis, pp. 1-19, 1991

[13] Gregory Chaitin, "Epistemology as Information Theory", 2005

[14] Mike Stannett , "The Computational Status of Physics", 2008

[15] D. Knuth, The Art of Computer Programming, pp. 1-9. 1973

[16] D. Knuth, The Art of Computer Programming, pp. 104-107. 1973

[17] A. Braunstein et al, Complexity transitions in global algorithms, 2002

[18] A. Tanenbaum, Operating Systems Design and Implementation 2nd ed., pp. 82-93, 1994

[19] A. Tanenbaum, Modern Operating Systems, 2nd ed., pp.132-152, 2001

[20] O. Khalid et al, Dynamic Scheduling of Virtual Machines Running HPC Workloads in Scientific Grids, 2009

[21] A. Tanenbaum, Modern Operating Systems, 2nd ed., pp.327-332, 2001

[22] Recommendation ITU-R BT.470-6, Conventional Television Systems, International Telecommunications Union, 1998

[23] A. Tanenbaum, Modern Operating Systems, 2nd ed., pp. 332-333, 2001

Expeditious Creation of Multiplayer Games for Second Life and OpenSimulator Virtual Worlds

David Mendes
Faculdade de Engenharia da Universidade do Porto
MIEIC
david.mendes@fe.up.pt

António Coelho
Faculdade de Engenharia da Universidade do Porto
DEI+INESCPorto
acoelho@fe.up.pt

Armando Sousa
Faculdade de Engenharia da Universidade do Porto
DEEC+INESCPorto
asousa@fe.up.pt

The main objective of this paper is to present the proposed mechanism for expeditious modeling of 3D content in a virtual world, so the same virtual limited space could be reused to create different content, over time. The context of this work is about the dynamization of groups and the integration of new people, that can be made using a virtual environment where all elements can interact and communicate. So, this work aims to develop a modeling platform to construct multiplayer game levels that incites players to use strategies of cooperation and competition between them, in the different contexts in which they are inserted. It is presented a methodology that allows to quickly and easily construct complete functional game levels to be used with groups of players, through expeditious modeling of the game elements, in Second Life and OpenSimulator virtual worlds.

In any group of people it is important to find activities and ways of interaction that stimulate and foster the communication and the dynamic of the group. Considering the great motivational power of digital games, their use appears to be a good bet to help the group dynamics, through a multiplayer game where all group elements participate and interact. It is important that the players could learn how to communicate and cooperate between each other, while they are playing the game in teams. So the project FEUP Adventure appears as context of this work. It aims to analyze the potential use of a digital game in the integration of newcomer students in higher education in the Second Life virtual environment (Cruz, Sousa, & Coelho, 2010).

On the other hand, from the use of a virtual world there is a problem that concerns with the limitation of available space in the virtual environment. Thus, there should exist a mechanism to create a great amount of content in a limited playing area, reusing the available virtual space.

Considering the objectives and mechanics of the FEUP Adventure project, it is used as the case study to this project. So, the goal of this work is to create the FEUP Adventure's game levels through expeditious modeling, making possible the reuse of a virtual game area to construct and use all the different levels.

Related Work

Considering the purpose of the levels to develop, it is important to analyze the serious games, and its usage in education and learning. Serious games is a game category whose primary purpose is not to entertain the user, but educate, raise awareness or teach something. They are developed with the intention of improving some aspect of learning, being used in emergency services training, in military training, corporate education, health care, and in many other sectors of society. They are also used in all levels of education and in all types of schools and universities (Derryberry, 2007).

(Squire, Barnett, Grant, & Higginbotham, 2004) concluded that students who participated in a module that used the Supercharged! game, which is a game created to teach high-level physics concepts (De Freitas, 2006), got better results than students who learned physics through practical experiences, demonstrations and simulations visualization.

The serious games industry is expanding rapidly, and there are numerous companies investing in this area (Design, 2011). Military, corporative, educational and health organizations around the world have also taken advantage of the positive effects that the implementation of serious games can bring to their educational needs (Derryberry, 2007).

Similarly the use of multi-user virtual environments as places to promote learning is currently seen as a good bet and more and more projects come in this direction, involving universities, teachers, businesses and many others. The study in (Ketelhut, Dede, Clarke, & Nelson, 2006) shows that using a multi-user virtual environment is possible to teach standard content (biology in this study) combined with complex research capabilities, better than traditional approaches. The study results show that students learned the content, that there was great concern from the students and teachers, that student attendance improved, and especially that the use of this technology in the classroom can facilitate a good learn-

ing and research.

Virtual World

The work presented in this paper was developed in Second Life, with possibilities to be used in OpenSimulator, that are multi-user virtual environments. They use the Linden Scripting Language (LSL), which is a state-based and event driven programming language. A LSL file script supports variables, functions and states, but the LSL is not an object oriented language, which may constitute a limitation, since most games created nowadays use the OOP paradigm in its design. However, many common used operations, such as collision detection, object instantiation, timers, etc, are present. Objects can be linked with LSL scripts, defining their states, functions and listeners accordingly with event occurrences (Cruz, Sousa, & Coelho, 2011).

On the other hand, they have a solid networking system and a multi-platform web client, that allow a great flexibility in the avatar creation process and in the control of each player. Besides, they have a 3D virtual environment ready to use, with modeling and editing possibilities.

Using the Virtual Space

The virtual world, as well as the real, has limitations in terms of space and extent of ground, and considering that the use of Second Life and its need to maintain a virtual island represents monetary costs, it is necessary to consider the development of a platform to maximize and reuse the space available.

In the FEUP Adventure project, the different levels were created in "layers", distributed vertically between floors where the levels are constructed (figure 1). Each level of the game was built in its own space and to be used all its elements (platforms, ramps, objects, etc.) must be constantly maintained.

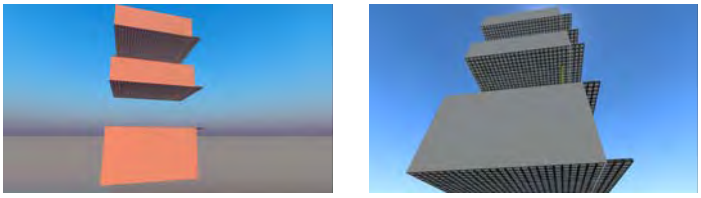


Figure 1. : FEUP Adventure's levels distribution in Second Life.

This approach allows to maximize the space usage, however is limited to the maximum altitude that the virtual environment provides. Each region has a maximum height of 4096 meters in Second Life and 10,000 meters in OpenSimulator (Vilela et al., 2010), and considering that each level may need a high altitude to host correctly the different elements of the game, the maximum number of levels that can be constructed vertically is limited.

It is also necessary to consider the minimum distance required between the different levels, to avoid the creation of to many object to be rendered in client hosts, and otherwise prevent players and all other users to be able to easily preview levels. This situation can happen because of the possibility of controlling the camera by each user, whose range can be set between 64 and 512 meters from the position of the avatar (Vilela et al., 2010).

Approach: Single Virtual Floor. The construction of a modeling platform allows using only one floor, where all levels of play are built, used and deleted. Through the generation of virtual objects in an expeditious manner, it is possible to ensure that all levels are reproduced in only one floor, while there is no need to keep the game elements unchanged and persistent. All elements and objects in each level are created procedurally in a few seconds, according to level's definition that is being used at that time. The levels definition process is done through an external file, outside the virtual world.

After the creation of the level, all elements are ready to use. Each player can be allocated to its team and immediately start the game. After the end of the game, all these virtual objects can easily be erased, the new game level is redefined and expeditiously created.

All this occurs in the same virtual space where players are: they play in this space and wait for the redefinition of the virtual levels. Since the creation of each level is a quick process, you can ensure that users do not get bored or distracted while waiting to play. On the other hand, the fact that all the avatars are in the same virtual space provides a greater control to the session's supervisor, since it is not necessary traveling between different areas.

Architecture

The platform works in a client/server architecture shown in Figure 2. The clients control their avatars in the virtual

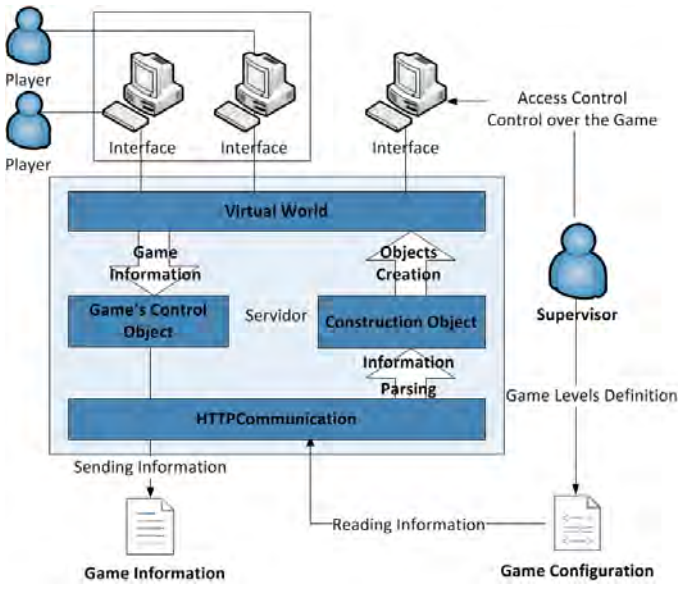


Figure 2. : Platform architecture.

world, managed by the server. There is a supervisor who is responsible for defining the game level through the game's

configuration file and controls the accesses and the course of the game through the virtual world. The server performs an HTTP request, through which it receives and interprets the setting for the desired level. The creation object allocates all virtual objects in the environment, according with their defined position and orientation. Throughout the game all the information is communicated to the game's control object, which is responsible for sending it via a HTTP request to a PHP script outside the server, which receives it and stores it in a file.

Levels Construction

To create and reproduce the 3D objects in Second Life and OpenSimulator and to be possible the modeling of game levels, it is necessary that these objects are previously built and stored in the inventory of an initial object, which will build the whole scene. This may represent a major limitation to the use of expeditious modeling, as it is necessary that each element to be used was already created and with their properties initially set. However, once complete the initial phase of creation and definition, all elements are ready to be inserted in the virtual world and used in the game. Moreover, given the simple and specific desired mechanics, it is possible to specify the types of objects that may be needed for the construction of levels, so their creation does not match a major impediment to the definition of different levels.

The different objects to use can be, among others:

- **Ramps**, that can belong to a team, or they can be public, and all players can use it;
- **Blocks**, that can be fixed, used as obstacle or with some interaction with other elements, or mobile, that players must move;
- **Spheres**, to be moved by players so they can achieve level's objectives;
- **Platforms**, that can be fixed or mobile, and can belong to a team or be a mutual element;
- **Walls**, to limit the game space or to represent each team zone.

As all objects required are mostly simple solids representations, they allow an easy interaction and game movements control, even through the limited and simple physics that is available in Second Life and OpemSimulator.

Required Objects

There are some game elements that must be taken into account, regardless of the game level that it is been used. It should exist a game control object, by which one starts the game and controls its duration.

There are also elements that allow the identification of each player's team: they are objects that players must wear in their avatars, being visible in order to easily identify its color. The creation of the teams should be held before the start of the game through the distribution of identification objects by the players. When an identification object is assigned to a player, it is placed and visible in its avatar's hand, indicating the state of the game - if it is running or stopped.

Construction Seed

As already mentioned, all required objects and elements must be initially created, defined and stored. They must be stored in the inventory of a construction object, the seed, which will recreate them in the virtual world, whenever the construction of a new level is required. This element is an object present in the virtual world, through which is done the interaction of construction and destruction of the different game levels.

It is the only object that is always present in the virtual space where the game will take place. Through it, the supervisor of each session requests the creation of a new level, which must be previously defined. The seed starts the level creation, through the recreation of each game element present on its inventory, with the defined properties.

The placement of each element in the scenario is made by moving the seed to the set position of the element, and using the LSL function

```
llRezObject
```

to create the object. Then it moves to the position of the next object, successively, until the entire level is built.

After the end of the game, the supervisor may require the destruction of the level through the seed, which takes care of eliminating all elements of that level, leaving the virtual space empty.

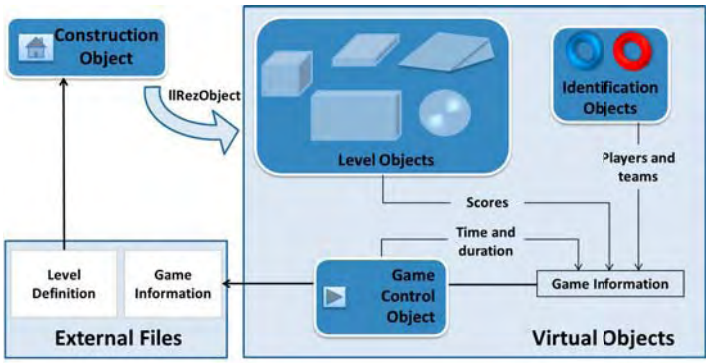


Figure 3. : General schema of existing objects.

In figure 3 are represented all objects and its interaction, between them and with the external files. The seed (construction object) reads the level definition and builds the virtual objects in the scene, as stated above. These objects are the identification objects, level objects and the game control object. They all provide game information, which is managed and sent by the game control object to the external file, where it is stored.

External Files

External files are intended to make the storage of information that can be viewed and edited outside the virtual world. In figure 3 it is represented the role they play in the interaction with existing objects. Thus, there is the level specification file, which corresponds to the file where is defined the configuration to be used in the game. In it are displayed the

virtual objects that are intended to be built by the seed, as well as its position and orientation in the game space. The game information file records the events of each game session occurred. In it are stored the allocations of the players to teams, the date and time of start and end of the game as well the teams scores and any other game information that should be registered. The definition, use and format of these files is explained in more detail in the next sections.

Level Definition

As already mentioned, the construction of game levels in the virtual environment follows the specification that was previously defined in the external file. Communication with this file is made by the construction seed. When the supervisor confirms the creation of a new level, the LSL script of the seed object enters a state of communication, making the request through the function:

```
llHTTPRequest(string url, list parameters, string body)
```

The response to this call contains the content of the url parameter, that corresponds to the definition file. This content is limited to a maximum size of 2048 bytes, so it is important to use the minimal amount of text in the levels definition, to avoid loses of information in communication and consequent failure in the virtual level modeling. Thus, the levels definition file is built using a simple configuration language. Each line contains this information: object_name pos_x pos_y pos_z rot_x rot_y rot_z (extra_param).

```
redTeamRamp 17.5 0.0 1.5 0.0 0.0 180.0
redTeamPlatform 23.5 0.0 2.8
blueTeamRamp -17.5 0.0 1.5
blueTeamPlatform -23.5 0.0 2.8

platform 10.0 -11.0 4.0
platform -10.0 9.0 4.0

blueTeamRing -1.0 2.5
redTeamRing 1.0 2.5

startGame 0.0 0.0 5.0 180.0 0.0 0.0 60.0
```

The construction object receives this information and makes its parsing. Each line correspond to a object to create and must have its name, its position and its orientation. The given position is according to the position of the seed in the beginning of the construction. Considering a virtual room to the creation of game levels, the seed is placed in the geometrical center of the space (figure 4), at the ground level. So the definition of each object position must be done considering an imaginary coordinate axes, whose center is in the geometrical center of the virtual space, at ground level.

The position is defined by the X, Y and Z values, which are represented in virtual meters, whereby the next line:

```
object 5.0 5.0 5.0
```

would construct *object* in the (5,5,5) position, relatively to virtual space center, i.e., 5 meters away from the 0 position in each coordinate. In figure 5 is visible the placement of

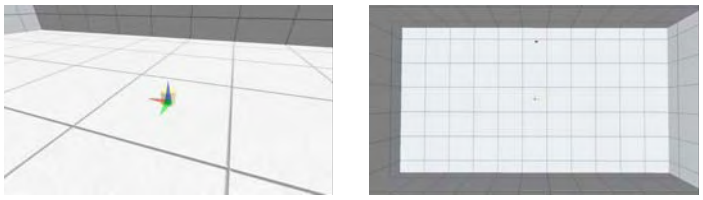
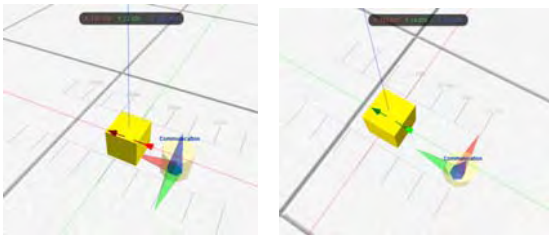
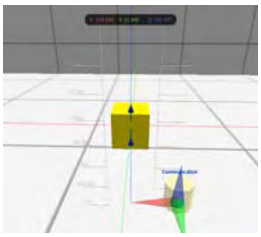


Figure 4. : Seed placed in the center of the virtual space.



(a) X coordinate distance (b) Y coordinate distance



(c) Z coordinate distance

Figure 5. : Distance relation between an object position and the seed position.

an object relatively to the seed position in the X, Y and Z coordinates.

The orientation of the object is given by the rotation relatively to the center of the object itself, and the values provided correspond to the desired degree of rotation (0° to 360°) relative to the coordinate axes (X, Y, Z). Thus, a rotation of 180° in the X coordinate would place the object vertically flipped. Figure 6 it is possible to check the different orientations of an object, rotating in the three coordinate axes.

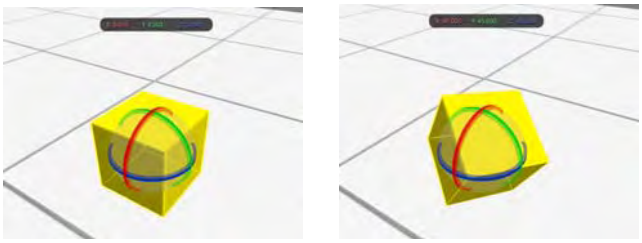
There are also objects that can accept an extra parameter in its creation (when they are rezzed), so this value should be placed at the end of the line.

It is important to assure that the order of the information contained in each line is correct, i.e., if it is intended to set the extra parameter in the definition of an object, all the previous values (position and rotation) must be indicated, even if they have the value 0. The line:

```
redTeamRamp 17.5 0.0 1.5 0.0 0.0 180.0
```

creates the *redTeamRamp* object in the (17.5, 0, 1.5) position, with 180º rotation relatively to the Z coordinate axe. The X and Y values of rotation are defined as 0.

On the other hand, if it is intended to create an object in the (0,0,0) position, without rotation nor extra parameter, it is only necessary to put the object name in the text line - all values are assumed as 0.



(a) Original orientation (b) 45º rotation in the 3 coordinate axes

(c) 45º rotation on the X axe (d) 45º rotation on the Y axe (e) 45º rotation on the Z axe

Figure 6. : Object orientation according with its rotation in the coordinate axes.

Game Information

The game control object stores all the game information (duration of each game session, teams formation and all the information received from the game objects). At the end of each game the LSL script of this object goes to a communication state (*sending*) where it sends all this information through an HTTP request.

```
request = llHTTPRequest(http_request_url,
                        [HTTP_METHOD, "POST",(...)],
                        "message="+messageURL);
```

http_request_url corresponds to the url of a PHP script, that receives the POST request and saves the *message* content in a text file.

This file stores the games registries and works like a log of all information about the game sessions. This registry has this format:

```
MESSAGE START
redTeamRing: Test User with red team
blueTeamRing: Test User3 with blue team
blueTeamRing: Test User2 with blue team
redTeamRing: Test User1 with red team
Game start: 2011-05-19T13:38:32
blueTeamPlatform 1
blueTeamPlatform 2
redTeamPlatform 1
blueTeamPlatform 3
redTeamPlatform 2
redTeamPlatform 3
blueTeamPlatform 4
redTeamPlatform 4
redTeamPlatform 5
redTeamPlatform 6
blueTeamPlatform 5
redTeamPlatform 7
Game end: 2011-05-19T13:39:33
MESSAGE END
```

Analyzing the information in the file it is possible to realize which team had the best performance in each game session. So, in the previous example, *Test User* and *Test User1* were playing in the red team and they achieved 7 points, while *Test User2* and *Test User3* were playing in the blue team and they achieved 5 points. The game lasted for 1 minute and started at 13h38, on 19/05/2011.

Results

A prototype was developed in order to have available a platform for game levels modeling in a virtual environment which could help in boosting the dynamic of working groups, helping the integration through communication and interaction between the players, while at same time makes easier and more efficient the usage of virtual spaces through the expeditious modeling of content, in the Second Life and OpenSimulator virtual environments.

Level Creation

The creation of a level is done through the interaction with the construction object, the seed. When it is touched, it is presented a menu with the options to create a new level or to delete the existing objects (figure 7).

Figure 7. : Create/delete menu of the game level.

Selecting the create option, the seed starts the scene creation, moving in the virtual area and creating successively all virtual objects, until all level is created and ready to be played (figure 8).

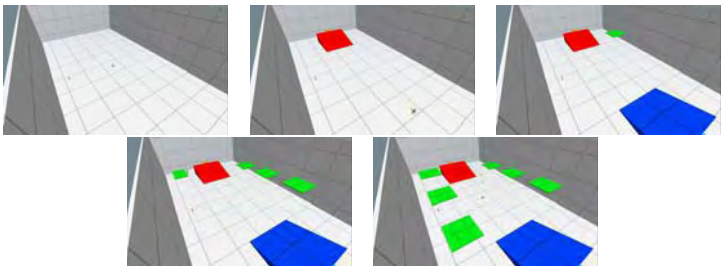
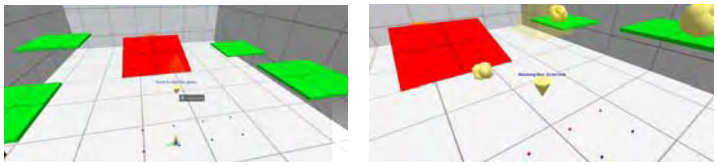


Figure 8. : Procedural creation of a game level.

All objects created in this prototype are ready to run the game once they are created. The game control object is always defined at the end of the definition file and is created in the center of the game area, a few meters above the seed (figure 9a). The game starts when the supervisor touches it, and while the game is running, it shows the remaining time until the end (figure 9b).



(a) Game control object (b) Game running

Figure 9. : Game control object.

The identification objects are rings that must be allocated to the players, according with their team. The number and position of these rings is also defined in the level definition file, so they were created in the center of the game area, as shown in figure 10.

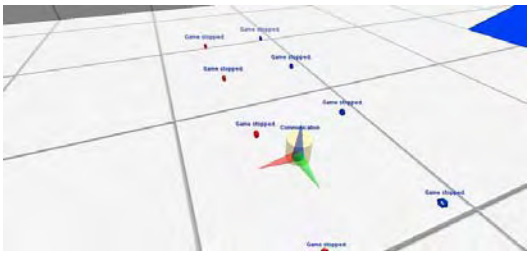
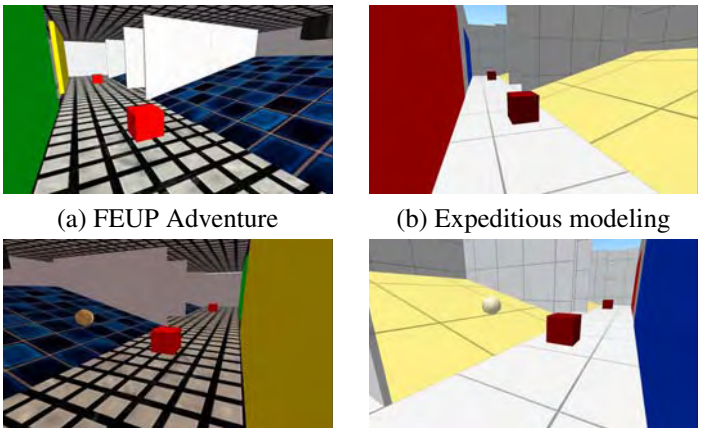


Figure 10. : Identification objects.

Case Study: FEUP Adventure

To test this platform, were reproduced the levels 1 and 2 of the FEUP Adventure project. This project stimulates the integration and interaction among students through a set of virtual game levels that need to be played in teams. These collaborative levels represent quite simple and specific objectives for their achievement by students, through strategies of coordination and cooperation among the players of a team. The levels are based on physics, in the motion of objects and orientation of each player's avatar.

The figure 11 is a comparison between one original level of the FEUP Adventure project and its reproduction in this prototype.



(a) FEUP Adventure (b) Expeditious modeling

(c) FEUP Adventure (d) Expeditious modeling

Figure 11. : Comparison Comparison of the construction of the second level of FEUP Adventure with the construction through expeditious modeling.

A key advantage of using the expeditious modeling platform concerns the possibility to specify some parameters that are not usually available, as the game time that the supervisor wants to the session or the time interval in which the spheres are constructed, for example. In addition, the number of elements in the level is easily editable, the supervisor can add or remove, for example, fixed platforms anywhere in the virtual environment. Otherwise these changes would only be possible by changing directly the LSL scripts of the objects or their internal properties (position in space, orientation, etc..). And also, in the FEUP Adventure project the objects are not editable and it is not possible to a supervisor to make these changes without being the owner of the respective objects.

Besides that, the possibility to create and eliminate the different levels allows greater freedom in the use of virtual space, since the use of a virtual object in the FEUP Adventure project requires it to be permanent and unchanged, and any elimination of elements in the virtual space is final and can only be recovered through its manual creation.

Conclusion and Future Work

The developed framework allows to streamline the level creation process of multiplayer games for Second Life and OpenSimulator virtual worlds, through objects' expeditious modeling. The available virtual space can be reused through the alternating construction of game levels. It was also implemented multiplayer game levels that can be used with teams and whose mechanics fosters communication and cooperation between players.

Virtual worlds like Second Life or OpenSimulator are not ideally suited for game development, given its programming limitations and weak physics control. However, its ease of use, in terms of creating, editing and controlling of avatars and virtual objects, its features and its accessibility make these environments a good choice when you want to develop a serious game, where teams are usually composed by few elements and have quick and simple objectives.

Despite the development of a mechanism of expeditious modeling of content in a virtual world, this project has several points where it is possible to evolve.

First, an aspect in which the prototype has some drawbacks is in the level definition process - although it is through a simple language, the fact that it is necessary to manually write the definition turns the specification of a level in a time-consuming and error-prone process. It is necessary to know the existing objects and their properties, and the definition of their position and orientation in the virtual space can become a tiring process. On the one hand the existence of pre-created settings allows the use and quick modeling of a game level, on the other hand the construction of an entire new level can be a difficult process for a supervisor of a session with this prototype. This difficulty can be overcome by creating an application that allows managing the existing objects, take note of their properties and indicate its position in the virtual environment. Such application would be outside the virtual environment and would act as an interface for specifying the virtual levels, through a 3D pre-viewer, eventually.

Another aspect that can be added to this prototype is the creation of more game levels, with the creation of more interactive objects and new mechanics for use with groups. Although the created levels in the prototype allow to verify the ability to create game mechanics that can be used with user groups, do not represent all the possibilities that can be achieved in virtual environments and that the expeditious modeling platform can use.

In general, the developed work presented in this paper has many possibilities to evolve, based on the developed prototype. Moreover, this prototype is a functional mechanism for expeditious modeling in a virtual environment, which, leaving the proposed general scope, it would be interesting to use in other purposes than the creation of games.

References

Cruz, A., Sousa, A., & Coelho, A. (2010). Using games to promote student integration in universities trough the use of virtual worlds - work in progress. *SLACTIONS2010*.

Cruz, A., Sousa, A., & Coelho, A. (2011). Technical analisys and approaches for game development in second life.

De Freitas, S. (2006). Learning in immersive worlds: A review of game-based learning. *JISC eLearning Innovation*, *3.3*, 73.

Derryberry, A. (2007). Serious games : online games for learning. , *2009*(June 17).

Design, M. S. G. (2011). *Serious games companies.* (Available in `http://seriousgames.msu.edu/companies.php`, accessed last time January, 2011)

Ketelhut, D. J., Dede, C., Clarke, J., & Nelson, B. (2006). A multi-user virtual environment for building higher order inquiry skills in science.

Squire, K., Barnett, M., Grant, J. M., & Higginbotham, T. (2004). Electromagnetism supercharged!: learning physics with digital simulation games. *International Conference on Learning Sciences*, 513.

Vilela, A., Cardoso, M., Martins, D., Santos, A., Moreira, L., Paredes, H., et al. (2010). Privacy challenges and methods for virtual classrooms in second life grid and opensimulator. In *Games and virtual worlds for serious applications vsgames 2010 second international conference on* (p. 167-174). IEEE.

The *American dream*

Narratives Of Space And Place In Second Life

Cátia Ferreira, Ma.

Catholic University of Portugal

Palma de Cima, 1649-023 Lisboa - Portugal

Abstract

Second Life is one of the most complex virtual worlds available due to one of its main components – user-generated content. In Second Life players are active contributors to in-world development, and only 1% of the contents available were created by Linden Lab; players are not only contributing to space, but also to its social development. Some researchers suggest that Second Life's development history reflect California's one; not only because Linden Lab is a Californian company, but mainly because Second Life is announced as "your world, your imagination", reflecting at the same time the "Californian ideology" (Barbrook and Cameron, 2001; Boellstorff, 2008) and the chasing for the *American dream*. The aim of this paper is to verify if Second Life's development may be considered a remix of the chasing of *American dream* by understanding how users are taking advantage of the building tools available, creating their own virtual places and fulfilling their own whishes. To accomplish this goal a qualitative methodology was used based on a multimodal netnographic research (Kozinets, 1998, 2002, 2006, 2010). The data collection methods were auto-netnography (Kedzior and Kozinets, 2009) and detailed observational data collection of 64 in-world locations.

Keywords: virtual worlds, space, place, remix platforms

Introduction

Through the last decade online games and social platforms became very popular and contributed to internet development. Virtual worlds or massive multiplayer online social games conquered a high number of users – in 2007 the number of users of these virtual environments was between 20 and 30 million but it was expected that this number would grow rapidly (Castronova, 2007), and it did, according to Kzero's[1] last report the number of registered accounts in virtual worlds in 2011 first quarter exceeded one billion – 1,185,000 registered accounts[2].

Virtual worlds are from two main types – game and non-game based. Game-based virtual worlds invite players to take part in a predetermined narrative. The player is invited to choose an avatar that will represent him in the virtual environment. Usually there is a set of avatars' types that represent the different characters of the fictional world[3]; each type having their own skills. These game-worlds may be developed under different themes, but fantasy scenarios where players have to fulfill different quests and defeat monsters seem to be one of the favorites[4]. While logged into these virtual environments players embody the chosen role interacting with other players and with non-player characters. Non-game ones, on the other hand, have no conducting narrative; they are just settings for virtual interaction. Non-game based virtual worlds offer a virtual space where players can build their own narratives and set the goals for being in-world. These narratives are built through the interaction with other avatars and with the setting. The majority of these multiuser virtual environments (game and non-game based) are open-ended; the game does not have a determined finish line, the world exists while users inhabit it and/or until the business owner turns the servers off.

The majority of non-game based virtual worlds are sandbox games – "authoring environments within which players can define their own goals and write their own stories" (Jenkins, 2007: 59). There is one sandbox game that takes this definition further and offers their players the opportunity to take part not only in world's history but also in its geographical development – Second Life.

In the first quarter 2011 Second Life counted with 25 million registered users[5], and it still is one of the most complex virtual worlds available (Boellstorff, 2008; Johnson, 2010). One of its main components is user-generated content: within this gamespace players are active contributors to in-world development, and only 1% of the contents available were created by Linden Lab (Ondrejka, 2006: 163); players are not only contributing to space construction – buildings, green spaces and general surroundings, but also to its social development – institutions and groups that will contribute to in-world's economy, culture, identity or hierarchical organization. Beside this, there are more four characteristics that make this multiuser virtual environment an interesting object of study: all the avatars existent in-world are playing characters controlled by human beings in real time; intellectual property – meaning that avatars own everything they create; it has its own micro-currency – Linden Dollar, that may be exchanged for 'real value currencies' through Linden Lab's exchange platform – LindeX; and all players have access to simple building tools and to Linden Scripting Language, which are the 'ingredients' to create objects (animated or not) in this virtual world.

Due to the fact that Second Life development is being based in user-generated content some researchers suggest that its development history reflect California's one; not only because Linden Lab is a Californian company, but mainly because Second Life is announced as "your

world, your imagination", reflecting not only the "Californian ideology" (Barbrook and Cameron, 2001; Boelstorff, 2008), but also the chasing for the *American dream* (Adams, 2001). The amount of time and effort players invest in Second Life may be measured by its complexity. Beautiful, interesting and harmonious destinations are available throughout this virtual world. As in California's case, players are transforming Second Life's empty land into a vibrant set of locations. Players are transforming virtual space into virtual places through new narratives of space and place.

The aim of this paper is to verify if Second Life's development may be considered a remix of the chasing of *American dream*. To accomplish this goal we will analyze several in-world locations in order to see how users are taking advantage of the building tools available, creating their own virtual places and fulfilling their own whishes. And as in the California case, some of them are even thriving. A qualitative methodology was used based on a multimodal netnographic research (Kozinets, 1998, 2002, 2006, 2010). The data collection methods used were auto-netnography (Kedzior and Kozinets, 2009) and detailed observational data collection of sixty four in-world locations. Our netnographic research was designed as an interactive model[6] (Maxwell, 2002) and our data analyzed through an inductive approach[7].

In order to fulfill the established goal, we will start by analyzing Second Life's development history and the transformation of virtual empty land into virtual shared places; on the second section we will see how territory is perceived and experienced by analyzing the role of the tools for land exploration; and on the third one we will see how users' spatial appropriation of the virtual world may be considered a remix of a first life cultural narrative concerning the centrality of property for achieving a better life and the possibility of success.

Second Life development history – turning space into places

By the time Second Life was launched the gamespace area was very limited (see Figure 1); there were only two main zones: Mainland and Outlands, and a lot of virtual space to be bought and explored. By that time Linden Lab managed the continents and created some locations within them, but there were already available user-generated places like Americana, Gibson or Lusk. If we look to a 2009[8] version of Second Life world map (see Figure 2) the growth of the territory is evident, by that time Linden Lab managed more continental areas – a total of nine, but the geography of this virtual world was now characterized by the amount of islands that populated its sea. While Mainland territories are still managed by Linden Lab, islands are managed by private owners – individual or collective ones. And it is through the analysis of private propriety that we can see how empty space is being transformed into inviting places. In order to understand the urban development of this virtual world, we need to define the concepts of space and place once "space and place have become totemic concepts for those exploring social, cultural, economic and political relations" (Hubbard and Kitchin, 2010: 2).

Space, representational spaces and places. According to Yi-Fu Tuan (2001) both space and place result from our experience as human beings and the negotiation we make with the surrounding environment. Henri Lefebvre (1991) suggests that space is produced through a 'conceptual triad': spatial practice, representations of space and representational space. The representational space emerges from the relationship we establish between spatial practice and representations of space; it emerges from our experiences. Tuan on the other hand presents space as being more abstract than place: "What begins as undifferentiated space becomes place as we

get to know it better and endow it with value." (2001: 6). Michel de Certeau considers that is difficult for space to be abstract and suggests that "space is a practiced place" (de Certeau, 1994: 117), and it takes shape when we move between places – "space is composed of intersections of mobile elements" (*ibidem*). Place is then defined by the experience of those who inhabit it (Hubbard & Kitchin: 2010). The transformation of space into place occurs through its organization (order) (de Certeau, 1994); when space becomes structured emotions tend to be attached to it, it gains meaning (Tuan, 2001; Bardzell and Odom, 2008).

Following the ideas proposed by Lefebvre (1991), Tuan (2001) and de Certeau (1994) we may consider space as pre-ordered, "situated as the act of a present (or of a time), and modified by the transformations caused by successive contexts" (de Certeau, 1994: 117); representational spaces as the result of a more personal relationship with space – like an in-between stage, between the 'pre-ordered' space and 'ordered' places; and places as the realization of the lived experience within the representational space – the lived experiences give us the opportunity to control and appropriate space. These three categories may also be applied to virtual environments, and they will help us better understand the relationship players develop with the gamespace.

The transformation of space into place within 3D game environments is almost inevitable. Due to the sense of being there – immersion, we tend to attribute meaning to the different locations we visit. Following de Certeau proposal we may understand the constitution of virtual space as the result of joining human creativity, technology and the desire of space control, nevertheless the emergent 'cybernetic society' in Second Life is not "self-moving and technocratic" (*ibid.*: 136), it is a creative and participative one. Because of this particular

characteristic we consider that in this virtual world both space and place are culturally produced through player generated space narratives – possible through the use of design and technology to "contrive and control a space for utterly free and self-governing action" (Malaby, 2009: 2). It is the relationship one establishes with the virtual space and places that will define our 'story' within this alternative sphere. While in the virtual world we feel free to explore, socialize and build, but in spite of being considered as an almost free space, Second Life is controlled by Linden Lab; players feel free but is the company that controls the main power – the platform's code and servers' control. The awareness of this control is not always present, because the actions of the 'ruling class' (the 'Lindens'[9]) are not always evident, and due to the world's size we do not come across 'Lindens' often.

When the first 'settlers' arrived at Second Life they found an almost empty land that offered them the opportunity to own and manage it; after eight years the result is a virtual space organized in a network of places and representational spaces. Due to the possibility offered to players to have an active role in gamespace development, Second Life is an interesting repository of user-generated content. It is remarkable how the transformation of space into place reveals players preferences regarding the places they want to live in and/or spend time in. Within this virtual environment we can find almost everything, from underwater bars, skyboxes (floating houses), or idyllic fantastic environments, to recreations of real life places.

Virtual places' typologies. According to Champion and Dave (2007) there are three types of virtual places one can create in virtual environments; players establish different relationships with each of them. We will characterize them in order to understand the nature of places created in Second Life. 'Spatial Visualization Virtual Environments' are those that

represent only spatial configurations and allow users to interact with objects. The second type is 'Activity-based' – users may accomplish tasks through the interaction with gamespace. The third type is the 'Hermeneutic', these environments require "the ability to personalize and communicate individual perceptions through artifacts" (*ibid.*: 342); in them the player feels at home. It is difficult to feel emotionally attached to a virtual place in the same way we do in first life and this characteristic makes hermeneutic virtual environments difficult to create (Champion & Dave, 2007). In order to understand the nature of Second Life environment we need to consider the possibility of a 'mild hermeneutic immersion' category (Champion & Dave, 2007: 342): players establish a close relationship with the virtual territory, they are owners of the majority of in-world contents, but due to the fact that the majority of locations were created by users it is difficult to ensure a homogeneous degree of quality in all available places. And not having a shared conductive narrative result in a slower immersion process; immersion in Second Life occurs through the engagement with other players but also with territory; it occurs when we are able to interact in a dynamic and memorable way with the virtual environment.

In the subsequent section we will characterize the different tools available within this gamespace that allow players to perceive space and at the same time are the main 'means of transportation' that take them to the different representational spaces and places available in-world.

Exploring the co-created territory

As it happens in first life, mapping the territory is a way to control and perceive it; mapping and cartography allow the emergence of a 'planetary consciousness' (Pratt, 1992), and

"provide the very conditions of possibility for the world we inhabit and the subjects we become" (Pickles, 2004: 5). In Second Life there are two types of maps – world-map and mini-map, and both are valuable tools for in-world orientation. Mini-map gives us access to a compressed visualization of the area where we are; it is useful if we want to have notion of the surroundings and allow us to locate other avatars. Avatars are represented by green dots and besides recognizing where we can find the higher concentration of them, through the mini-map we can teleport to the available nearest location. This functionality is very important because the most popular destinations use to be those most requested by users; people tend to prefer going where they can find other avatars, once the possibility of interaction and socialization increases. Regarding the world-map tool, this gives us a representation of the world as a whole in an aerial top-down perspective. The player may decide on the perspective zoom degree, the minimum zoom show the world as a whole (the world is so wide that in order to recognize the whole map we need to scroll horizontally), and the maximum is region centered perspective, where it is possible to see region's topography, areas and number and location of visitors (through the same system of 'green dots'). There are some features incorporated in world-map like direct teleportation for chosen places, 'filters' to control the visible information and destinations' search engine. Both mapping tools beside the traditional representation of territory, play also the role of 'wayfinding' (Pile and Thrift, 1995), as they contribute to the process of "visiting in turn all, or most, of the positions one takes to constitute the field… [covering] descriptively as much of the terrain as possible, exploring it on foot rather than looking down at it from an airplane" (Mathy, 1993: 15 *apud* Pile & Thrift, 1995: 1). They allow us to move within different regions and toward different destinations.

While space is perceived through the maps, place is perceived through exploration. Due to world's dimension and topography is difficult to explore it 'by foot', or even flying. The majority of territories are islands and to cross the virtual sea we would need a fast boat and a good orienteering. The easiest ways to find places in this virtual environment is through the official destination guide (available in and out-world), the platform's search engine or through directly clicking in a world-map's location. Only the first two options give us direct access to complementary information about the chosen site, but all use teleportation to transport players to the chosen destination.

The described tools play a very important role in the relationship established with territory; mapping is a way for Second Life users perceive the virtual world as a whole and to materialize it despite its digital condition. Additionally to its role as "geographical conquest of 'empty space'" (Gil and Duarte, 2011: 1), mapping also attenuates the 'dematerialization' of space that occurs through the use of teleportation as primary mean of transportation. Once "[teleportation is a] figurative negation of real space" (Aarseth, 2007: 45), and is a functionality that may contribute to a non-perception of space.

In Second Life virtual space is, then, being transformed into virtual places. Players invest in land and take advantage of the built-in tools to develop the territory, and at the same time to perceive it as a whole. In the following section, we will explore this virtual world as a remix platform, where cultural narratives are being constructed both individually and collectively. We want to understand if the effort made by players to transform 'empty' land into a prosperous one may be considered a remix of the *American dream*.

Remixing the *American dream*

United States of America (USA) are seen as the land of opportunity since the first migration waves to this country in the 18th century. The independence from the British Crown allowed the settlement of a free country where "all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness" (*The Declaration of Independence*, 1776); and ever since migration waves having USA as destiny transformed this country in what we know today. These immigrants share a common goal since the 18th century until nowadays: they are chasing the *American dream*. Even having only been defined in the 20th century by James Truslow Adams (1931/2001), the *American dream* is part of America's national narratives, and even of Western cultural ones. USA represents freedom, and the possibility of success once everybody have the opportunity to make individual choices without the prior restrictions that limited people according to their class, caste, religion, race, or ethnicity.

In the second half of the 20th century the *American dream* contributed to the rise of a new paradigm that is seen by some researchers as one of the major influences for the emergence of virtual worlds – the Californian ideology (Barbrook & Cameron, 2001; Boellstorff, 2008). The Californian ideology emerges from the particular culture of this state – the mix between the Silicon Valley ideology with the bohemian lifestyle of San Francisco. It is based on the principle of the emancipator potential of new information technologies (Barbrook & Cameron, 2001: 364): in cyberspace everybody will be both hip and rich. The new spatial dimension made available through the internet is seen as the new land of opportunity and virtual entrepreneurship may be the answer to the chasing of the *American dream* in the 21st century.

Being the Californian ideology a first life narrative from Second Life "hometown" it is reflected in the "modus operandi" of this virtual world. As in the *American dream* the possibility of prosperity through freedom, propriety, and civil rights is a major characteristic that contributed to the fast settlement of this virtual environment.

Through the analysis of the data collected we realized that avatars have a close relationship with territory; owning land is really a major feature of Second Life. Throughout the world is possible to admire user-generated places, and the majority of them are very complex – they are compound of different elements (natural or architectonic) and 'decorated' with many objects. It is rare to find a 'simple' place that does not offer a minimum level of interactivity to the visitor. Places seem built not only to entertain, but to make visitors comfortable and connected with the virtual place. Some of them were even constructed to transport the visitors to fantasy realms; they look dreamily real. Our experience was that the more interactive and complex a space was the more people seem to consider them as places and to spend more hours there. The majority of the visited places were owned and managed by groups of residents and reflected the groups' purposes – for instance, Artropolis (see Figure 3) is owned by a community of artists and is a village constituted by ateliers of different Second Life artists, where we can find different exhibitions; Luskwood (see Figure 4) by a community of furries that manage a social area settled within a natural environment; Epiphany Island (see Figure 5) by an Anglican community offers a place for worship and reflection; La France Pittoresque (see Figure 6) is managed by the French community in Second Life and offers a social place where French is the main language and predominant cultural frame; or Avilion Mist (see Figure 7) owned by a role-

play community inspired by medieval fantasy and that offer to visitors a thematic commercial space and a role-play gamespace.

Another interesting aspect that we noticed through our observation is that design of in-world places seems to follow some real life rules. Despite the fact within Second Life we are in a dimension free from the majority of real life constrictions, we tend to design spaces that reflect our real life needs. Almost all places we visited and explored were decorated with harmonious objects and offered comfort to its visitants: for example, is usual to find sitting places from different types throughout the world; avatars build houses with kitchens, living rooms, bedrooms and bathrooms as they need to fulfill the same needs; public places offer many different activities and ways of interaction – we can go shopping, to a concert or to a bar, is only a matter of choosing what we want to do, then to check the possibilities with the platform search engine, to choose a destination and teleport. Teleportation, as seen, is the main mean of transportation within Second Life. Cars, planes, and all type of transportation means we can imagine are also available, but due to world's growth it is almost impossible to travel from one side to the other by other mean than teleportation. Some places even offer teleportation to their sub-places; but during our observation this seemed not a very popular option, since we saw only few people using it. Teleportation is often used to move between different regions and locations, but less used to go from one sub-place to another; avatars tend to prefer to fly (when allowed) or walk; in locations with larger areas public transportation is sometimes the choice – amongst the most common free-public transportation are trams and bicycles. Using other means than teleportation to explore a particular location is the way avatars have to perceive, feel connected with the digital territory, and to understand it as a network of places and representational spaces.

Conclusions

Our analysis of Second Life geographical development helped us to realize that we can understand this virtual world as a remix platform. Lawrence Lessig conceptualized remix as "the mix [that] provides new creative work" (Lessig, 2008: 69), in Second Life virtual space is being transformed into virtual places through the mix of simulations of real world with fantasy. The remix of popular cultural narratives are transforming Second Life into a very complex virtual world, where cultural narratives are being constructed both individually and collectively. The effort made by players to transform 'empty' land into a prosperous one may be considered a remix of the *American dream*: "The *American dream* is that dream of a land in which life should be better and richer and fuller for everyone, with opportunity for each according to ability or achievement. […] It is not a dream of motor cars and high wages merely, but a dream of social order in which each man and each woman shall be able to attain to the fullest stature of which they are innately capable, and be recognized by others for what they are, regardless of the fortuitous circumstances of birth or position." (Adams, 2001: 414-5).

Second Life is seen by its residents as a new land of opportunity – for $10/month we can have and manage a reasonable plot of land, where we can build whatever we wish. Besides the freedom regarding in-world territory, within this virtual world we can be whoever we want and we are able to pursuit our dreams and eventually have a prosperous second life. Second Life is, then, a remix platform that allows us to mix fiction and reality and to develop new cultural narratives based on the motto: 'Your life, your imagination'; and this offer may be understood as

a remix of the classic *American dream* and its transformation into an *international American dream* (Meadows, 2008: 117).

References

Aarseth, E. (2007). 'Allegories of Space: The Question of Spatiality in Computer Games". In F. von Borries, S. P. Walz and M. Böttger (Eds.), *Space, Time, Play*. Basel, Boston and Berlin: Birkhäuser, 44-47.

Adams, J. T. (2001). *The Epic of America.* New York: Simon Publications [1931].

Barbrook, R. and A. Cameron (2001). 'Californian Ideology'. In P. Ludlow (Ed.), *Crypto Anarchy, Cyberstates, and Pirate Utopias*. Cambridge, MA: MIT Press, 363-387.

Bardzell S. and W. Odom (2008). 'The Experience of Embodied Space in Virtual Worlds'. *Space and Culture 11*, 3: 239-259.

Boellstorff, T. (2008). *Coming of Age in Second Life*. Princeton: Princeton University Press.

Castronova, E. (2007). *Exodus to the Virtual World: How Online Fun Is Changing Reality*. New York: Palgrave Macmillan.

Champion, E. and B. Dave (2007). 'Dialing Up the Past'. In F. Cameron and S. Kenderdine (Eds.), *Theorizing Digital Cultural Heritage*. Cambridge, MA: MIT Press, 333-347.

de Certeau, M. (1994). *The Practice of Everyday Life*. Berkeley: University of California Press [1984].

Gil, I. and J. F. Duarte (2011). 'Introduction: Modernity's Fluid Cartographies'. *Journal of Romance Studies,* 11, 1, 1-9.

Hubbard, P. and R. Kitchin (2010). *Key Thinkers on Space and Place*. London, Thousand Oaks, New Delhi: Sage (Second Edition).

Jenkins, H. (2007). 'Narrative Spaces'. In F. von Borries, S. P. Walz and M. Böttger (Eds.), *Space, Time, Play*. Basel, Boston and Berlin: Birkhäuser, 56-60.

Johnson, P. (2010). *Second Life, Media, and the Other Society*. New York: Peter Lang.

Kedzior, R. and R. Kozinets (2009). 'I, Avatar: Auto-Netnographic Research in Virtual Worlds'. In N. T. Wood and M. R. Solomon (Eds.), *Virtual Social Identity and Consumer Behavior*. New York: M.E.Sharpe, 3-19.

Kozinets, R. (1998). 'On Netnography: Initial Reflections on Consumer Research Investigations of Cyberculture.' In J. Alba and W. Hutchinson (Eds.), *Advances in Consumer Research*, vol 25, 366-371. Provo, UT: Association for Consumer Research.

Kozinets, R. (2002). 'The Field behind the Screen: Using Netnography for Marketing Research in Online Communities'. *Journal of Marketing Research 39*: 61-72.

Kozinets, R. (2006). 'Netnography 2.0'. In R. W. Belk (Ed.), *Handbook of Qualitative Research Methods in Marketing*, 129-142. Cheltenham, UK, and Northampton, MA: Edward Elgar.

Kozinets, R. (2010). *Netnography: Doing Ethnographic Research Online*. London, Thousand Oaks, New Delhi: Sage.

Lefebvre, H. (1991). *The Production of Space*. Oxford and Cambridge (Ma.): Blackwell (1974).

Lessig, L. (2008). *Remix: Making Art and Commerce Thrive in the Hybrid Economy*. New York: Penguin.

Malaby, T. M. (2009). 'These Great Urbanist Games: New Babylon and Second Life'. *Artifact 2,* 3: 1-7.

Maxwell, J. (2002). *Qualitative Research Design: An Interactive Approach*. London, Thousand Oaks, New Delhi: Sage.

Meadows, M. S. (2008). *I Avatar: The Culture and Consequences of Having a Second Life*. Indianapolis: New Riders Publishing.

Ondrejka, C. (2006). 'Escaping the Gilded Cage: User Created Content and Building the Metaverse'. In J. M. Balkin and B. S. Noveck (Eds.), *The State of Play: Law, Games, and Virtual Worlds*. New York and London: New York University Press, 158-179.

Pickles, J. (2004). *A History of Spaces: Cartographic Reason, Mapping and the Geo-coded World*. London and New York: Routledge.

Pile, S. and N. Thrift (Eds.) (1995). *Mapping the Subject: Geographies of Cultural Transformation*. London and New York: Routledge.

Pratt, M. L. (1992). *Imperial Eyes: Travel Writing and Transculturation*. London and New York: Routledge.

Thomas, D. (2006). 'A General Inductive Approach for Analyzing Qualitative Evaluation Data'. *American Journal of Evaluation 27*, 2, 237-246.

Tuan, Y.-F. (2001). *Space and Place*. Minneapolis, London: Minnesota University Press (1977).

Footnotes

[1] Kzero is a consulting company specialized in virtual worlds, virtual goods, augmented reality and social gaming. One of Kzero's outputs are the reports regarding virtual worlds' growth, the main results of these reports are published also in company's site and blog – www.kzero.co.uk and www.kzero.co.uk/blog/.

[2] Report results available at http://www.kzero.co.uk/blog/?p=4599.

[3] In the majority of games despite having to choose a standard initial appearance, once logged in the avatar is customizable.

[4] World of Warcraft is the most popular game-based virtual world with over 12 million subscribers worldwide (http://www.businesswire.com/news/home/20101007005648/en).

[5] According to Kzero - http://www.kzero.co.uk/blog/?p=4599 (June 3, 2011).

[6] A research design that has "an interconnected and flexible structure" (Maxwell, 2002: 3).

[7] "The primary purpose of the inductive approach is to allow research findings to emerge from the frequent, dominant, or significant themes inherent in raw data, without the restraints imposed by structured methodologies." (Thomas, 2006: 237).

[8] We chose to show a 2009 map because it is difficult to reproduce a more actual version due to world's territory growth.

[9] The representatives of Linden Lab in the virtual environment – the most important figure is Governor Linden, the virtual materialization of company's ruling power; there are also representatives of Linden Lab staff, and those are all the avatars whose last name is Linden.

[10] Objects and avatars are animated through programming codes; these scripts may be for getting our avatar dancing a specific dance or song; or may add interactivity to objects.

Figures

Figure 1 Second Life world map in June 2003

Figure 2 Second Life world map in April 2009

Figure 3 Artropolis

Figure 4 Luskwood

Figure 5 Epiphany Island

Figure 6 La France Pittoresque

Figure 7 Avilion Mist

Visual perception in metaverses.
Consuming advertising through the avatar's eyes

Eduardo Zilles Borba, MSc.[1]

University Fernando Pessoa, Portugal

[1] Master in Communication Sciences at University Fernando Pessoa. PhD researcher in Information Sciences at University Fernando Pessoa with the FCT Program scholarship (ezillesborba@gmail.com).

Abstract

To assume a personality, to control its actions and to fulfill tasks are characteristics intrinsically related to the virtual worlds, as example: metaverses and videogames. In this perspective, it is possible to consider the expression of Kerckhove (1995) which suggests that in a certain way we carry through a psyche's plastic surgery, or, simply we venture ourselves for digital environments searching for entertainment or the fulfilling for what we cannot make (or to be) in real life. Considering this, the aesthetic and functional technological advance of imaginary environments – for times a faithful representation of the material space, this article presents a discussion on the visual perception that we have of the advertising (billboards) in virtual worlds through our avatar. The debate is supported through literacy references on the videogames and virtual reality, but also reveals a qualitative analysis established in the data collected during an exploratory observation to the universe of bits: Second Life (metaverse) and Pro Evolution Soccer (videogame). It's intent to launch a critical look to advertising inserted in ludic and simulator spaces of the real, as well as understanding the form that our "detachable eye" consumes such advertising messages. It means this paper isn't a proposal of a miraculous system of measuring the in-game advertising efficiency, but yes it is a complex reflection to understand how the player interacts with the advertising (at least if he recognizes it during the missions and digital quests), its field of vision, time of exposition to the Media...

Finally, it is stand out the interest for understanding the visual perception of an avatar is related to the main objective of the author, who carries through a PhD research focused on the digital simulation of the experience of visualizing billboard advertising in urban and architectonical structures. Creating such tool is justified by the possibility to become more performative and connected the action of researchers and professionals of the advertising area.

*Keywords***:** in-game advertising, visual perception, avatar, metaverse paradigms, videogames, space representation.

Visual perception through the digital screen

When faced with the cyberculture experienced by the information society in these early decades of century XXI, where it is common to use digital technologies and applications to perform, in a virtual way, tasks of the physical world, as a trip to the bank or a business meeting, everyone realizes how much we interact with digital screens.

Although Coelho (2010) has emphasized that deal with a huge range of media is no longer a new thing to the contemporary world (newspapers, movies, SMS's, emails, iPods, computer games, etc.), the convergence of media enhances the creation of a specific semiotic in these environments, thereby becoming a language (Manovich, 2001). "It's not just the convergence of media forms, but in a more fundamental level this process involves the convergence of semiotic systems" (Coelho, 2010, p.17).

In this process, the digital screen appears as the main element of support, mediation, filtering and modeling between virtual and real worlds, able to affect how people produce, perceive and see the content, and therefore how they understand subjectivity and experience with the digital age world. "The digital screen has become the main way to access to any information ... read newspapers, watch movies, communicate with colleagues, relatives and friends and, above all, to work," (Manovich, 1995, p.94 *cit. in* Coelho, 2010, p.20). Now, regardless of the users being natives or immigrants of cyber culture (Dyson, 1995), it is remarkable the phenomenon of familiarization they deal with the logic of digital narratives. People assimilate the non-linear narrative style of interactive spaces and understand the deep layer's navigation in the search for content, breaking the paradoxical routine of linear reading to give space for a hypertext exploration, guided by visual logic and controlled by the wishes of the user in following the path he really wants. Empirically, this is proven every day with the increasing familiarity of users with the Internet and other multimedia applications.

Anyway, even if the intermedia characteristic is a greater value to digital content language, inevitably, digital screens are framers. They are spaces of mediation that separate the real space of the virtual space, where there's an obstacle to the way for the total immersion. Thus, visual perception turns out to be the perceptive sense that acts in great proportion in the user experience with the virtual environment. It is because of the view that the contents represented visually are interpreted on the screen. For example, in the case of videogames, the user sees the electronic world through a character/avatar. All that the character is able to see (and feel) will be seen by the user, including senses not mediated by the computer screen, but were captured through the human retina, processed by the brain and aggregated in the subjective and emotional resolution that the user has with the virtual world through the prosthetic body of avatar (feelings). Once again the videogame universe is remembered as example "of this struggle between proximity and distance ... this tension between identity and reality of being in front of the screen ... that prevents players from falling into the dream world of fantasy for a long time," (Coelho, 2010 , p.24).

In order to rectify the semiotic tension between being inside or outside the digital screen, some theorists argue the ability of transparency mechanisms to sharpen perceptions of the human body, even in a non-immersive virtual reality mediated by the computer (Zagalo, 2010; Bordwell, 2001; Cameron, 1995, Bolter & Gromala, 2003). "The cinema, television or interactive media depend on the visual representation to exist, however the relationship with their active or passive receivers is a total immersion", (Zagalo, 2010, p.35). Transparency in this context would be the ability to cancel the sense of mediation between the real and virtual worlds with the support of mechanisms that lead to the organic/physic world the illusion of the senses generated in the inorganic/virtual world.

However, if language in the digital universe extends, converges, and also creates narratives for specific electronic applications, it is pertinent to consider that some languages

are more efficient than others to wake the user (outside the screen) greater degree of involvement with the electronic landscape (inside the screen). It corroborates the idea that information society has a perceptual experience on the screen based on the concept of activity, rather than an experience based on the concept of instrument (Antiquity) or operation (Classicism) (Neves, 2010). According to the author, the concept of activity values human contact with their own environment, as the navigation routine in virtual worlds makes people to understand the own body as a feeling, not essentially different from the electronic landscape. There's not a clear and complete dichotomy between the human being (center of subjectivity) and the virtual representation (inhumane).

> "The real body felt by the internet user is also a feeling that is not centered on the idea of the unity of the self. It's another thing: they are feelings which the sentient of one or another side (inside or outside the screen) are not different… is not just the visual perception but the inorganic feeling that shapes the way we see and perceive… perception is an action which constitutes the most important relation of human beings with their environment… it's the way people interact with space… perception is above all an exploration method", (Neves, 2010, p.97-101).

From this quote, it's possible to say that life activities (even urbanities) are represented in virtual worlds, but the body who commands those visual tasks, from the real world, does not significantly enters in this virtual reality. Inside the digital screen are presented simulations of the world and its several routines. Outside, is the user's organic body, that sometimes enters in the screen universe through visual (emotionally) resources and moves a character (a self-representation) around the figurative scenery using control devices with keyboard, mouse or joystick (Levy, 1999).

Please note that most of the human body senses are not mediated by digital screens - especially smell and taste. They remain outside the screen, attached to the organic body.

Inside the screen, user's detachable body represented by the avatar (a hybrid cyborg that explores the virtual world guided by the real user) transmits through its vision field a visual idea about the experienced sensations, as a kind of feelings visualization (Kerckhove, 1995).

In virtual worlds[1] mediated by a non-immersive virtual reality emotions can be stimulated by visual and audio components. They influence the mediation transparency. The Gestalt Theory is an example of using graphic mechanisms as color, shape and perspectives patterns to influences the visual perception. They are visual resources who work sending to the brain the imagery ideas about any perceptive feeling activated in the inorganic human body during the explorations through the virtual cities. The individual interprets the character/avatar subjectivity – things he probably saw during the plot adventure in a videogame or navigating in a three-dimensional application – to associates to similar experiences or preview knowledge from the material world. For example, with the organic body has had the experience of seeing a car explosion, or at least understands the concept and the senses awakened in this kind of situation, it will be able to connect the dots and builds a perceptual experience through the screen, but actually this experience was stimulated only by the visual perception (he saw the fire, the fire warms, the fire burn, the fire burns my body with in contact with the character/avatar).

Advertising on the metaverse (urban) landscape

Connecting the concepts earlier presented (on the user perception in virtual worlds) with some advertising practices from spaces that emulates the reality, precisely in the metaverses, essentially two models stand out: those originated from the conceptual essence of the real world advertising (billboard, print ad, poster, etc.) but have different clothing (online banner, pop ups, etc.) and those graphic sceneries with advanced design, aesthetically similar

structures and architectures of the urban landscape, actually in a simulator platform from the original version (Thomas & Penz, 2003, Zilles Borba, 2011; Picon, 2004).

In virtual worlds the most appropriate advertising model matches to the second example, which transposition involves space and (body) movement through the space. It is doubtful suggest that in hyper-reality the advertising image is consumed by the avatar's eyes, because it is an advanced aesthetic and narrative model, based on modeling, texturing and animating techniques of 3D tools. Ramonet (1999, *cit. in* Piccinin, 2009) considers that three-dimensional design is able to re-create a synthesis of image so similar to the real one that sometimes it's seen as more real than the real one. Ashbee (2003), emphasizes the imaginary ability as one of the essential qualities of digital animations, distinguishing it from the implicit realism, after all, digital images are mathematic images originated from binary codes.

A lot of advertising implementation in virtual worlds is based on the universe of videogames (Carless, 2006). The advertising applied to the electronic architecture (in-game advertising[2]) would be similar to out of home media applied to the city architecture and structures of urban space because it's just like a real space simulator model. In a Formula 1 racing videogame simulation, for example, the boards of sponsors displayed around the track would have the same importance for the game plot composition as the user interaction with the object (the pilot with the car). Of course, drive the car is a key to the success of the game, but the noticed details make all difference when talking about the construction of user's involvement with the virtual reality. In short, the audible and visual elements could work as mechanisms of transparency (sound of car engine, stands with an audience, advertising on billboards around the track, pits and equipment with detailed mechanical, etc.). The same applies to simulators of the football practice or any other sport where the virtual stadiums have advertising posters that reinforce the spatial configuration of the scenery and, of course, give brands a specific window to communicate with a specific audience.

Methodology

This article is a reflection on advertising in virtual worlds and metaverses, in particular the way user perceives and consumes such images in front of a digital screen. Thus, it focuses on finding answers to questions related to the perceptual experience of the people when consuming the advertising in virtual worlds (narrative, transparency, etc.).

On this way, besides introducing concepts on the subject, was felt a necessity to see (and feel) this semiotic experience with the advertising elements in virtual environments. Exploratory observations in two virtual worlds characterized by the simulation of urban spaces of the real world had been carried through: the metaverse Second Life[3] (SL) and the Portuguese version of the football videogame Pro Evolution Soccer 2011[4] (PES 2011). In both cases, the observations were done by the author, serving as a methodological tool for collecting data related to research questions (in addition of being a form of approximation to the advertising virtual space). From the contact with virtual worlds were generated two reports that were the basis for the discussion about the space, the body, the vision and the advertising.

Exploratory observations

With the intention to reflect about the user experience with the advertising in virtual worlds, two digital platforms representing the real world were observed: the SL and the PES 2011. In both observations were collected data that supports the reflection about the thematic, they're components and elements related to the visual (and body) perception when consuming such virtual representations of advertising messages. Also, this article has concerned recommendations discussed on the earlier sections (Levy, 1999; Kerckhove, 1995; Coelho, 2010; Neves, 2010; Zagalo, 2010; Thomas & Penz, 2003).

Pro Evolution Soccer 2011 (PES 2011)

PES 2011 is a football videogame for computer and consoles that simulates the sport practice through advanced modeling, texturing and animating resources of three-dimensional and programming technologies. The squad matches are presented on the digital screen by realistic visual expressions and interactive representations. It is a physic-virtual transposition that includes football arenas, team equipments, players and details of an authentic celebration to the football modality. Not enough about the landscapes graphic realism, game involvement is also stimulated by sound perceptions, as example, the singing supporters and the sound effect of kicking the ball or a violent contact with opponents.

In PES 2011 the game involvement starts even without the ball rolling in football pitch. It means, before visualizing the three-dimensional scenery where actions develops during the match simulation, a series of interactions related with the plot personalization is suggested to the user controls, since choosing the preferred team till selecting an adjusted scheme to challenge the opponent (Figure 1). All this personalization settings are configured through a visual interface dominated by graphic and typographic elements, and some infographics, with schemes, tables, numbers, arrows and technical data about all athletes. Although do not exist any advertising message at this moment of the game, and so, before playing virtual football, the visual codes used to explain complex information make it easy to understand patterns or to compare players skills, beyond stimulating the user/player involvement with the plot of the game.

Still, before playing virtual football, the application shows an animation in full motion video (FMV) which has 3D images like cinematographic movies animations, but this time the stars are the football players. Even the narrative in the third person is similar to the cinematographic field. It is like the user always has the best place to observe all players movements (Figure 2). In the FMV animation was identified the first advertising message of

the game (Figure 3). During around twenty seconds it shows the players passing in a narrow corridor and in this space appears some advertising posters affixed at the wall. They promote sports brands, football institutions and even top competitions organized by Fifa[5] or Uefa[6]. This first contact was kind of discrete because they were in a second layer of elements disposition, behind the players. Anyway, their format means to be efficient because the clean and simple aesthetic resumed to the brands linguistic expression. Also, when the FMV makes a camera movement of approximation to the athletes, turns interesting the opportunity to realize details from their physics and, also, details from their equipments, including sponsor's image and the clothes manufacturer company.

The best use of advertising messages in PES 2011 is really perceived at the moment the plot come to the pitch field. User can see a series of posters, signs and objects spreading brands concepts around the visual chaos of the football arena (Figure 4). This ludic communication intends to convince people outside the screen to get a more emotional involvement with the virtual reality. For example, as well as the eyes, the ears catch the sound of the fans, the booms of the fireworks and any kind of noise that simulates the atmosphere in the entertainment scene. In fact, visual and sound creates a perspective experience on the screen disclosing perspectives, depths, dimensions, scales, textures and other information that, theoretically stimulates the body outside the digital screen to immerge to the virtual world, some place between physic and digital, between organic and inorganic. At last, in digital screen the avatar's eyes are established with the user's eyes.

Also, during the lots of exploratory observation to this virtual environment, it stayed clear that the abundant advertising format emulates the adboards[7] styles (Figure 5). They occupy significant area of the electronic landscape, presented in the main vision of the plot and lodged around the football pitch and stadium superior structures. Many times, its communication messages were purely institutional, limiting itself to spread the brand image,

either logo, a color, a figure or just words. In less expression also could be seeing smaller posters next to the fans communicating their devotion to the squad (support sentences or symbolic images related to the club).

When finally the match begins, and the ball starts rolling at the pitch, the game main camera takes a distance of the player's simulations opening vision area. This camera movement makes the graphics lose some graphic qualities, but in circumstance the space is easily assimilated, as well as the advertising in the game landscape. Although the when playing the game the user has a full concentration in the ball action there's lots of moments where the advertising enters in the scenery vision field. It appears again in a second layer of elements identification because it's not intent to be more visible than the players and the match duel, but they are imperative to create the game atmosphere (advertising, flags, fans, photographers, team area, coach, referees, stadium electronic board, etc.). In this direction, the already famous brands were easily memorized, probably because they already have signs and symbols engaged in people minds (names, colors, figures, forms, etc.) Anyway, it is important to confirm that at anytime the advertising were a species of noise or disturb for the avatar tasks. By the other hand, they enforce the game landscape realism and the landscape realism enforces people immersion in the virtual world.

Curiously, when exploring PES 2011 some advertising shows movements that alternates its linguistic and plastic message. They were like circulatory adboards: advertising boards with two images in one space, where only one was show at time. They stayed twenty seconds exposed before changing images and could be presented in two combinations: same brand different images or different brands (and images, of course). Again, an obvious influence of the real world inspires to create advertising format in virtual worlds, therefore the regular adboards were also presented with the same characteristics from the original versions:

short text, legible typography, impact image, company logo, strong contrast between main image and background color, etc.

The regular configuration of PES 2011 suggest playing the game in third person narrative is the best way for interacting with the scenery, anyway there are options to change the vision perspectives. It includes a series of distances and angles from different points of view in third and first person narrative. In case of replaying the best moments, the FMV were again called up to show details and realism. The replay virtual camera cannot be modified by the user, but adopts new perspective (from above, from behind, from side, etc), including first person narrative, in which the avatar's eyes guides the user to interpret details of a nice shot, a polemic off-side or a goal. In replays, the landscape image is underlined remembering replay techniques from television emissions. FMV animation generates proximity with advertising because it represents the past actions in slow motion, making it easy to recognize elements around the football pitch. The goal is the replay where the advertising is best exposed because it allows user to configure any point of view to review the action. So, here is an example of synthesis image where information can be considered better than the real situation could anytime be. It means revealing visual information not identified during the original act).

It's important to underline that brands who communicates with in-game advertising in PES 2011 are the big ones from the real world. The most brands were from sports and equipment sector, football clubs and automobiles: Nike, AC Milan, Manchester United, Ford, Toyota and Audi. Others brands were from the segments: credit cards, banks, airline companies and telecommunications.

Second Life (SL)

SL is a three-dimensional virtual world free of objective and missions. Is an online community which doesn't exist levels and requirements, where the user is allowed to create or

simply explore the space (socialize, design, party, study, etc.). To live in a virtual world, the habitant needs a form that represents its identity, which is visual traduced as an avatar. “Is all about the virtual corporal representation, and it can be constructed like a mirror of the real user image, that is, a human being, or can even though have the similarity of an animal or na extraterrestrial”, (Angeluci & Santos, 2007, pp.58.59).

In this direction the SL creates parallel lives, fantasies the impossible plans people have, or even the desire to assume another identity, in a kind of psyche’s plastic surgery that resumes to the search for the accomplishment of dreams that cannot materialize in the real world (Kerckhove, 1995). Also, the capacity of moving and controlling the avatar are fundamental in a virtual environment like SL, after all, the user just dislocates in the cyber-urbanities through the avatar.

To approach the empirical exploration to the three-dimensional scenery that’s SL, it makes necessary to create an avatar and personalize its physic aspects like the body, the clothes and particular moves. However, was used an already done avatar from the author. The narrative in SL is directed to the first person experience, as well in first-person-shoot games (Call of Duty, Medal of Honor, etc.) in which user sees the world through the same perspective of the avatar (Figure 6). Anyway, as almost all of the virtual worlds, it is possible to personalize the virtual camera, even to a third person narrative. But, the first option seems to be the one where the outside and inside screen feelings are better mediated. It transparency and involvement has more potential with this point of view.

The first territory explored was the island of the Honk Kong Polytechnic University. When transporting the avatar to the institution virtual space was possible to identify lots of building and structures that simulate library, auditorium and others areas probably similar to the original ones in Hong Kong (aesthetics, scales, etc.). The avatar explored inside and outside areas, but wasn’t possible to found any advertising. Anyway, it was identified similar

structures to street posters and billboards spread around the digital landscape (Figure 7). They served to support the navigation and the exploration to objects, zones and activities related to that island. The most interesting about those images was the user could move closer the avatar and interacts with the multimedia contents on the board. It means a similar structure of the real world billboard, but a non-linear narrative armed of interactivity and multimedia information about products, services, events, etc.

The exploratory observation also takes the avatar to simulations of real cities, especially the ones where communication elements can be identified as part of the urban space. It was opted to explore representations of Paris and New York.

At the French capital the observation was limited to the Eiffel Tower zone, where a significant number of advertising could be identified. Inside an elevator to reach the top of the tower there were three advertising images: an art gallery, a music gig and a parachute jump service. All promotions related to SL activities.

Same experience was felt in the New York space simulation. The major difference was the ambience. New York had much more urban and architectural structures where the advertising was adapted. Also, in a corner street an advertising-man represented by an avatar dressed up with two advertising posters attracts people attention (Figure 8). This maneuver brought some questions about the ambulant advertising practice, therefore, since that each island in SL possesses its exclusive construction and action perimeters, theoretically this avatar could take any brand message to others spaces. Identifying this communication was like proving that user can give any use to the platform, as if the imagination was always stimulated to think outside the box.

It is a reality that posters and billboards are the elect advertising format in SL. And it might be justified in two ways: the first is connected to the environment usability and avatar interactivity with space, people and objects; and the second, although says respect to the

content of the poster, it passes a little to the side of the advertising topics to center itself in the educative problems, because nor all posters and billboards in SL promote products, services or events. Mainly the ones that are place together monuments, building entrances, museums and stores function as an informative module that teach how to handle a car, to use the elevator or, simply, to inform what exists inside the structure the avatar desires to penetrate.

In generally, participation in SL is an extremely entertainment. By times, biological sensations not able to be mediated by the computer are psychologically understood and they kind of materialize feelings with the support of visual and sonorous combinations.

Finally, during the exploratory observation stayed clear that most advertising in SL are from events, services and products from the metaverse. Rare was the case of consolidated brand advertising in the researched sceneries. Perhaps, because a greater brand possesses its proper SL's territory where promoting products and services could be more personalized and related to the brand's philosophy and atmosphere.

Reflections about consuming advertising messages in metaverses

There are no doubts that three-dimensional interactive worlds have the potential to emulate human being practices. Since urban structures till the interpersonal relations, in these environments the visual representation not only looks for the graphic realistic approach, but also for the functions carried through by the user with an avatar, a kind of alter ego or similar copy of the person who's controlling it.

The advertising in metaverses, simulators or videogames is important because its elements participate on the city's landscape configuration and, being a simulation of the real space, the communication elements of a public space could not be forgotten. However, the exploration guided by the avatar's eyes indicates some divergence in the form user perceive advertising in electronic landscape. In first place, one notice that the plot of both observed

examples are different (PES 2011 and SL), especially because interactions do not develop in the same environments. And, even that both have characteristics of virtual worlds, only SL can be considered a cyberspace world, because the geographical area for social networking, while PES 2011 has an limited action zone to the world of the football pitch and the stadium elements. The second divergence is also related to the landscape and the advertising. The way immaterial representation is mediated to a material feeling. On this way, PES 2011 presents a third person narrative, which user sees the scenery and its avatar. This interactivity format turns colder and less emotive the relation with its avatar (and with the space), but the vision field turns amplest to realize all elements existing in the space around the game action. That is, it is obtained to perceive better advertisings around the main field at the stadium structures.

In SL, the immersive potential is better explored with the first person narrative which creates in the user's mind a good participation feeling. The first person camera view is a kind of transparency mechanism with high potential to cast the organic and the inorganic body. It means, walking through streets in virtual world and perceiving promotion images turns into a regular practice.

Even so, PES 2011 and SL have opted to transform some models of out of home media in virtual ways, but each one of them adopted a different format. Exactly, the conceptual essence of the advertising pieces is the same one, but the styles are differed. In PES 2011, for example, the user's contact with advertising messages occurs about 90% of the times through virtual adboards visualization. They have a short and direct message, similar to what happens to advertising boards in the real world. Also, in PES these messages have an institutional communication and almost all the brands promote their own websites or just the company's name. Other advertising model in the game are more like merchandising, where players equipments were transpositions of real market products (boots, t-shirts, etc.). In turn, the frequent advertising formats in SL are the street posters. They promote events, products

and services carried through inside proper SL. Its great advantage if comparing to the PES 2011 adboards is the user explores the communication pieces with adequate vision field for an indeterminate time. Also the aesthetic and literal composition of SL's street posters follows the same knew prescriptions models of real world, but in SL they are interactive and multimedia.

At the end, it was possible to identify a huge difference between brands advertising in PES 2011 and SL. At the first example, brands are consolidated in their business sector and act strongly in the real world. In virtual space, they extend communication to attract a specific consumer. In fact, most of brand's images are know by the mass audience, what makes simple to recognize cognitive codes in the virtual world, as example: colors, letters or figures (Sony, Nike, Audi, Toyota, etc.). In opposite, identified brands during the SL exploratory observations looks for a commercial dialog, promoting activities and objects from the inside screen world. In consequence, they're almost all brands playing exclusively in SL.

Conclusions

At first, is possible to conclude that virtual worlds have an enormous potential to stimulate user's visual perception. It could be through third or first person narrative, since it uses transparency mechanism to cancel or reduce the tension of mediating the outside and the inside screen experience. In fact, the SL was the environment where the illusion of immerging in a non-immersive virtual reality (conducted by a computer interaction) works better, perhaps because its narrative and content visualization explores the first person experience of walking freely around the virtual space. It means, in this kind of metaverse, everything the user sees (and feels) is interpreted through the avatar body experience. This way, the user detachable eye is capable to register perceptions lived by the avatar (in an inorganic field) and transfer this idea, memory or thought to the real body (outside the screen). In short, the user

doesn't feel biologically what happens inside de virtual world but can imagine that feeling because perceives it visually and has capacity to interpret its impacts in the avatar's body.

Also, was concluded that advertising in virtual worlds are aesthetic and functionally similar to their original versions. It is an obvious conclusion if considering the essence of the simulation: make it similar to real. Even being a three-dimensional space with synthetic representations, the visual perception experience works similarly to the real experience (perspectives, depths, textures, colors, illumination, forms and other characteristics from vision field are imperative to visualize a poster or a billboard in the truly cities). It brings another conclusion, that in metaverses and virtual worlds the advertising is represented at most of the times as an element integrating the urban landscape. It means formats like the posters, adboards and billboards make use of the game scenery to be in a good attention place in visual meanings. This happens a lot in PES 2011 with the adboards in the middle zone of the football pitch.

Finally, it was concluded advertising in PES 2011 and SL really doesn't explores all the transparency mechanisms potentials from the digital communication. It limits itself to be a transposition of the original version, what brings a very nice graphic realism to the plot, but ignores the hypermedia potential of digital narratives in virtual spaces.

Bibliography

Angeluci, R. & Santos, C. (2007). Sociedade da Informação: o mundo virtual, Second Life e os crimes cibernéticos. *In: The International Conference on Forensic Computer Science.* Sao Paulo: Abeat.

Ashbee, B. (2003). Animation, Art and Digitality. From termite terrace to motion painting. *Architectures of Illusion. From motion pictures to navigable interactive environments.* (pp 1-50). Bristol: Intellect Books.

Bolter, J., & Gromala, D. (2003). *Windows an Mirrors; Interaction Design, Digital Art and the Myth of Transparency*. Massachusetts: MIT Press.

Bordwell, C. (2001). *Film Art: An Introduction* (6th ed.). Indianapolis: McGraw-Hill.

Cameron, A. (1995). Dissimulations – illusions of interactivity. *Millennium Journal*.

Carless, C. (2006). IGAs Townsend On BF2142 In-Game Ads. *In: Gamesutra*.

Coelho, Z. (2010). Da instabilidade do ecrã. *Ecrã, Paisagem e Corpo*, Comunicação e Sociedade (pp 17-34). Coimbra: Gracio Editor.

Dyson, E. (1998). Release 2.0: A Nova Sociedade Digital. Sao Paulo: Elsevier.

Kerckhove, D. (1995). *A Pele da Cultura*. Lisboa: Relógio D` Agua.

Levy, P. (1999). *Cibercultura*. Sao Paulo: Editora 43.

Manovich, L. (2001). *The Language of New Media*. Massachusetts: MIT Press.

Neves, J. (2010). A experiência perceptiva do ecrã. Novas perspectivas interdisciplinares. *Ecrã, Paisagem e Corpo* (pp 95-111). Coimbra: Grácio Editor.

Piccinin, F. (sem data). Do analógico ao digital: notas sobre o telejornal em transposição. *Metamorfoses Jornalísticas 2: a reconfiguração da forma* (pp 154-173). Santa Cruz do Sul: Edunisc.

Picon, A. (2004). Architectural and the virtual. Towards a new materiality. *Journal of Writing + Building*, 114-121.

Thomas, M., & Penz, F. (2003). *Architectures of Illusion. From motion pictures to navigable interactive environments.* Bristol: Intellect Books.

Zagalo, N. (2010). Da Transparência. *Ecrã, Paisagem e Corpo*, Comunicação e Sociedade (pp 35-54). Coimbra: Grácio Editor.

Zilles Borba, E. (2011). A transposição físico-virtual do cartaz. *In: Seminário sobre o cartaz no estágio de comunicação integrada.* Porto: Universidade Fernando Pessoa.

Annexes

Figure 1 – Squad personalization

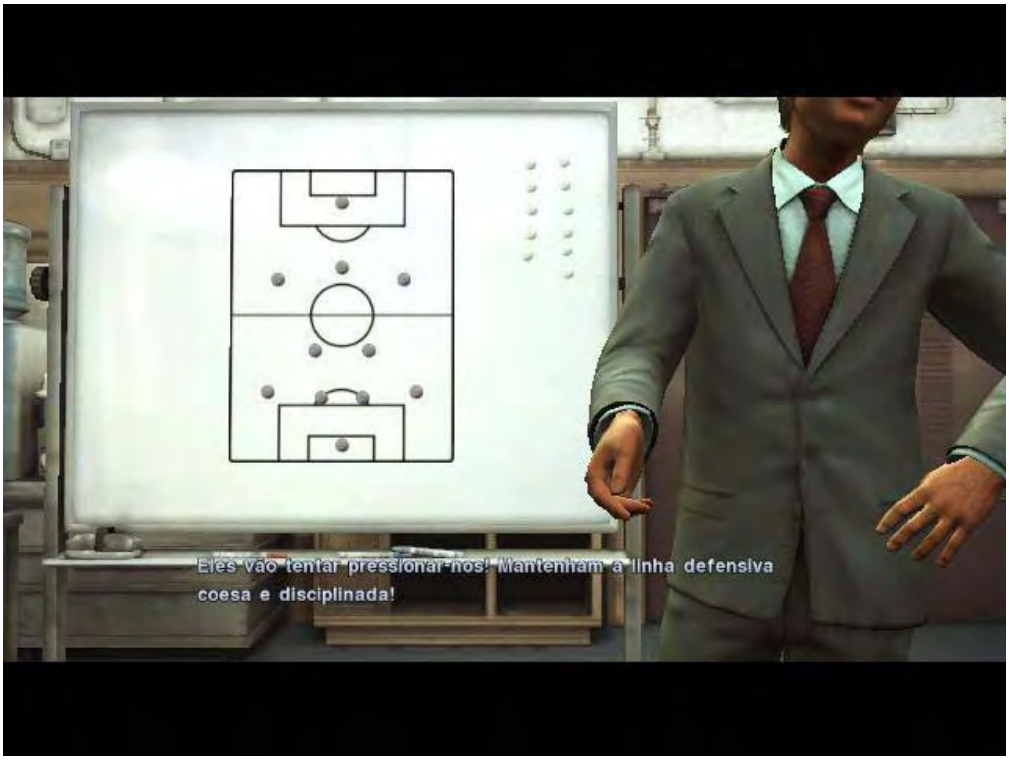


Figure 2 – FMV animation

Figure 3 – Advertising poster in the FMV animation

Figure 4 – Football pitch in the FMV animation (adboards at the background)

Figure 5 – Adboards around the main field of interactions

Figure 6 – Visualizing the world in SL through the avatar

Figure 7 – Hong Kong Polytechnic University represented in SL (interactive posters)

Figure 8 – Ambulant advertising-man in NYC represented in SL

References note:

[1] Klastrup (2003) says the virtual worlds are on-line representations in sincronic interaction between users and the space, ruled by own world concepts, as navigable universe.
[2] According to online encyclopedia Wikipedia, in-game advertising is the same as advertising in video games and computers. It can be integrated in the digital environment through an exhibition in the background, such as billboards inside the soccer stadiums or an advertising spot on video during the game break.
[3] http://www.secondlife.com
[4] http://www.konami.com/games/pes2011
[5] Fédération Internationale de Football Association (http://www.fifa.com)
[6] Union of European Football Associations (http://www.uefa.com)
[7] Advertising boards

"WOMEN, ART AND POWER", International Women's Day, March 8, 2011

Yolanda Arana López (avatar name: Ina Karura)

MKAC's Director.

Email: karuramuseo@hotmail.com

Eva Bonastre (avatar name: Noke Yuitza)

Open Science Director and MKAC's Coordinator of Technologies, Avd. Diagonal 645, UB's Fac. Biology.

Email: openscience.invirtualworlds@gmail.com

" Women, Art and Power " its the collective exhibition organized, in the metaverse of Second Life, for the Direction of the MKAC to commemorate the "International Day of the Woman ", on March 8, 2011.

Figure 1: Logo of **Women, Art and Power** project.

INTRODUCTION

The organization of the exhibition "Women, Art and Power" is the desire of the management of Museum Karura Art Centre (MKAC), joining the worldwide celebrations of the International Women's Day, March 8th 2011, but in his case from the perspective of art.

Its aims to highlight, through it, the important role-played by women in the world of the art throughout the different historical periods, they live in, and through different styles, techniques, themes and resources.

Another objective is to highlight the developments that have lived the history of art and the women themselves, since they have started to participate and intervene in areas that until very recently, were heritage for men: management, artist management, direction and management of museums and galleries, curatorship, collecting ...

CONTENTS OF EXPOSURE

The exhibition aims to offer a wide range of artistic interpretation of the world seen from the female perspective, based on the personal idiosyncrasies of each and its expressive world throughout the centuries and also from various conceptualizations and different levels.

This has been scheduled three exhibitions that complement and reinforce each other, while highlight the impact it has had the appearance of women in the art scene:

a) ***Painters of XXth and XXIst centuries***, brings together 21 contemporary artists (Yolanda Carbajal, the author of the exhibition poster, Zenaida Cajahuaringa Rivera, Dora Castro Castro, Mª Xesús Díaz, Victoria Fontana, Irene Gomis, Mar González Pérez, Isabel Gutiérrez, Carmen Holgueras, Luz Letts, Mª Jesús Leza, Elisabeth López Avilés, Mónica Lowenberg, Lilia Lujan, Imma Merino, Eulalia Peñafiel, Roxanna Rignola, María Rubio García, Raquel Sarangello, Lea Steirensis, Ingrid Tusell, Natalia Veli), of different nationalities and artistic and personal trajectory, to interpret and portray the reality through conceptualization of individual through different resources, styles, techniques, themes, etc.. It contains two works by each artist, with a corresponding sheet, photograph and

biographical texts and curriculum. Located in the Main Building, it's the most important exhibition.

Figure 2: Photography of the exhibition located in MKAC's main building.

b) ***Painters from XVIth century to early XXth***: located in Schumann's Building, is composed of works by painters who have died (S. Anguissola, L. Fontana, Elisabeth L. Vigée-Lebrun…). Intended to reflect the history of painting and women between the XVIth and XXth centuries. Two works form the exhibition, each of the 21 selected painters, with their technical specifications, a biography of the artists and a text on his artistic style and curriculum.

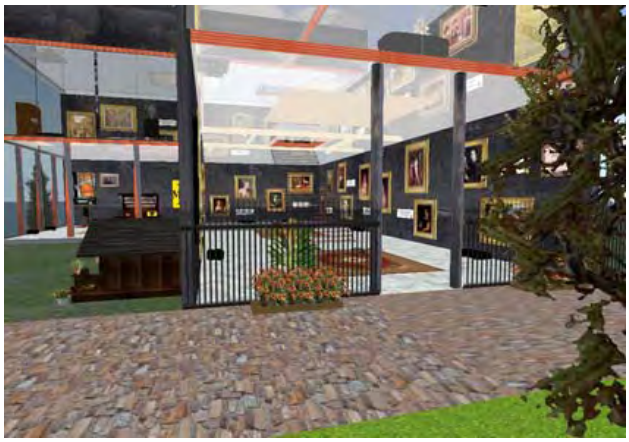


Figure 3: General view of ***Painters from XVIth century to early XXth***, in Schumann's Building.

c) ***The most influential Spanish women in the international contemporary art***: it is formed by the 21 most powerful women in the world of the contemporary international art: gallery owners, curators, directors of museums, big collectors… (Juana de Aizpuru, Helga de Alvear, Carmen Cervera…). Located in the Aularium of the museum, it consists of a photography of each of her, informative and explanatory texts on their trajectory and professional relevancy in the different positions and charges that they have redeemed in different public, private, national and international institutions.

Through the election of 21 women for each exhibition, a quantity representation number, we wanted to reflect that the XXIst century is, and will be, the moment for the women in the world of the art.

OBJECTIVES

a) To commemorate the "Day of Women," March 8, 2011, from the perspective of art.
b) To show the evolution of painting, made by painters, throughout the history of art.
c) To display diversity through different painting and different techniques, themes, artistic resources ....
d) To show the influence in all facets of women in the world of contemporary art and the art market.
e) To invite reflection on the role of women artists in society past and present.
f) To promote and publicize the career of the painters participating in this exhibition.
g) To establish professional ties between the painters that are part of this project.

PLANNING AND PREPARATION

The exhibition " WOMAN, ART AND POWER " is begun to prepare, in October, 2010, with the achievement of a programming in which it's decide and mark the principal performances to continue as for targets, contents, methodology, events, calendar of the above mentioned performances...

Then, the direction of the MKAC make a selection, depending on several variables, of the artists who participate in it and taking into account the inclusion of artists both emerging and consolidated.

It makes contact with the artists selected through public and private institutions, and proceeds to the selection of works to be displayed in the exhibition.

Finally, prepare texts about the artists, the technical specifications of each work and a biography and resume of the artist.

The selection of the most influential Spanish women in the international art scene is done according to professional criteria.

All texts of the exhibition are conducted in Spanish and English.

METHODOLOGY AND DEVELOPMENT OF EXPOSURE

Introduction

It takes place in the Alegret Hall of the museum on March 8 "International Women's Day", at 23.30 h. a lecture by Tanee Almendros (avatar name in Second Life).

After finishing the lecture, Karura Art Centre establishes a debate on this initiative of the Direction of the Museum, on the importance of the achievement of this type of projects, the advantages of the use of the technologies of

the information and the knowledge in the achievement and publication of artistic and cultural projects and in the interaction between the virtual and not virtual worlds.

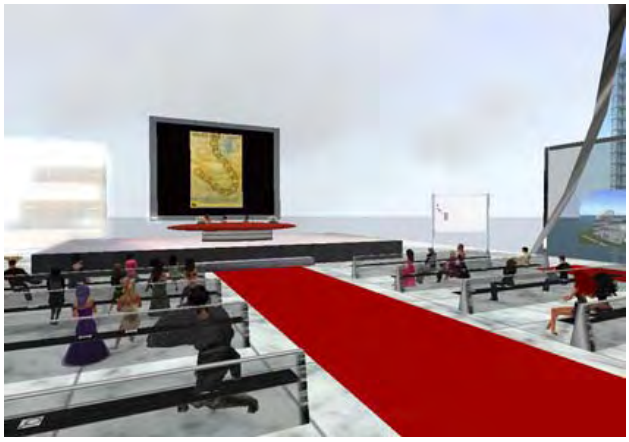


Figure 4: Moment of the opening of the exhibition.

Activities and Events

a) **Day of the Artist**: the establishment of this day is to enhance the trajectory of each of the contemporary artists participating in the exhibition through different activities that differentiates, for one day, from the other participants with information panel in the Velazquez Hall dedicated to the artist, messages in forums and Facebook and in different Second Life's groups, among others.

b) **Meetings with artists**, explaining their work and career to people attending, as per example the meeting with New York painter Victoria Fontana on April 7th.

Figure 5: Artist Victoria Fontana explaining her artworks.

c) **Literary events and presentation of books**: there is programmed the presentation of two books which contents are related to the feminine subject-matter.

The first presentation, which is realized on April 21, is done by writer Alberto Infante of his work *Line 53*, a book of 14 histories that turn concerning the women.

The second presentation, on June 1, in the Alegret Hall, is done by Rosa Montero, one of the most important Spanish journalists and writers of our panorama. The writer presents her latest novel, *Tears in the Rain*, characterized as Bruna Husky, her main character, a replicant detective woman, as avatar in Second Life. Because of the big success of this event, the presentation is broadcasted using LiveStream on the net to the whole world and re-transmitted in other Second Life's SIM, due to the impossibility of people that want to come to the museum to see and listen Rosa Montero and cannot because the capacity of the museum was completed. This event (that was done with the collaboration of Tanee Almendros, Yolamat Amat, Ketk Petrov, Siete Sands, nubleblanca3 Yuhara and Noke Yuitza) conclude with a total of 304 visits that day to the museum, and with the participation of the writer, like voice in off, in Ketk Petrov's video " WOMAN, ART AND POWER ", that realizes about the exhibition.

Figures 6: 1) Presentation of the novel *Tears in the Rain* of writer Rosa Montero. 2) Rosa Montero's avatar characterized as Bruna Husky, her main character.

d) **Guided tours**: there is programmed a whole of 3 guided tours to the entire exhibition by the three buildings of the museum and a whole of 52 assistants.

e) **Recital of poetry** takes place on March 24th in the Aularium and is coordinated by Nubeblanca3 Yuhara (avatar name). In this poetry reading, each of the participants select and recites a poem after which sets a floor for comments and discussion. The show is broadcast simultaneously on radio.

Figure 7: Moment of the development of the recital of poetry.

f) **Discussion**: During the two months that the exhibit, perform various gatherings whose content runs in three directions: the influence and role of women in art, the trajectory of the artists participating in the exhibition and the "International Women's Day" and the achievements, thanks to this commemoration, in the world of art by women.

g) **Sculpture competition**, takes place during the months of March and April under the title of the exhibition.

h) **Audiovisual equipment**: a video is made about the exhibition "Women, Art and Power" with the voice in off of the writer Rosa Montero making a synopsis of her last novel *Tears in the Rain*. (http://www.youtube.com/watch?v=OWQgqJXnU0k)

i) **Interaction between the participating artists**: the Direction of the MKAC establishes mechanisms of contact and communication between the painters who settle in two directions: between the director of the museum and the painters and between the proper artists who support exchange of e-mails.

j) **Publicity of the events in Real Life of the participant artists**: the direction of the museum realizes, while the exhibition lasts, publicity of Real Life events related to the taking part artists: openings, awards and mentions...

k) **Closing Concert**: Performed on Thursday, May 5, in charge of the singer Karma Auer with a great attendance (132 people came to this event).

DIFFUSION

The Direction of the museum programmes 3 central points of action in the publicizing of the exhibition: before the opening (across an invitation and a press release), a month ago and one week before its closing ceremony.

The advertising is aimed at different types of media, including virtual media outside and inside metaverse's platforms, as newspapers and radio (local, national and international), forums and websites, Second Life's groups and personal invitations, among others.

As a result of this, the impact of the realization of this exhibition transcends the barrier of the virtual which is reflected in:

a) ***Real art in Virtual World,*** *a Vigo's teacher of History of the Art manages a virtual museum with more than 32.000 visits*: article in **Faro de Vigo's Newspaper** on March 7, 2011, in their paper and digital editions, that talks about the MKAC and its exhibition "WOMEN, ART AND POWER " -in the paper one, the article took 3 / 4 parts of a page-: http://www.farodevigo.es/sociedad-cultura/2011/03/07/arte-real-mundo-virtual/524633.html

b) **Radio interview:** the museum's director, ina Karura, is interviewed on March 19, 2011, in the radio show "De tú a tú": http://www.teknoartia.com/podcast_radio.htm

c) Other websites, with no relation with the museum, amplify the event on internet, as per example:
http://foro.artelista.com/museo-karura-art-centre-mkac-t10624.html
http://realismoenlapintura.wordpress.com/2011/03/04/exposicion-% E2% 80% 9Cmujer-art-and-can% E2% 80% 9D /
http://www.blogger.com/feeds/2712780656349223559/posts/default
http://www.bogamiaarteymoda.com/index.php?option=com_content&view=article&id=120&Itemid=168
http://vuestroarte.blogspot.com/feeds/posts/default

d) Inside Second Life's world, the result of the impact is felt in articles in various magazines as SVnoticias.Other Events

"WOMEN, ART AND POWER" IN NUMBERS

a) Museo Karura Art Centre (MKAC) in Second Life:
- Main Building: 3,228 visits
- Schumann's Building : 3,126 visits
- Aularium: 1,462 visits

a.1) Guided tours:
- First tour: 16 persons
- Second tour: 22 persons
- Tour with the artist Victoria Fontana: 14 people

a.2) Closing concert:
- Attendance: 132 people

b) MKAC's Blog Views:

http://mkac.wordpress.com/: 2,581 visits
http://www.flickr.com/photos/48492520_@_N03/: 1011 visits

b.1) Visits to other forums:

http://foros.secondspain.es/component/option,_com_joomlaboard_/_Itemid,_42/func,_showcat_/_catid,_27/: 2607 visits
http://www.irenemuni.com/foro/25-vt1582.html?start=360: 2101 visits

c) Audiovisuals and Media:

- Interview in print: 1 interview
- Radio interview: 1 interview
- Videos: 1 video, "Women, Art and Power", uploaded to YouTube on June 7th, with 137 visits, by the moment

INCIDENCE OF VIRTUAL WORLDS IN PHYSICAL WORLD

As one can see, the incidence and interaction between virtual and non-virtual, programming and development of this project, reaches a very high degree.

As a result, the MKAC, a virtual museum, has established bridges and relationships between the museum and artists, promoting contact between artists that have participated in this initiative, and also between journalists, writers and other interesting people related to the world of the art outside the "virtual" tag.

For the MKAC the relevance of this project is measured not only in numbers, but, and apart of the echo of this project in paper and digital media, in the fact that some of the artists have added this exhibition to their curriculum and presentations (per example, this is the case of the artist Mónica Löwenberg http://elescapararte.es/usuario/MONICA+LOWENBERG), what reaffirms that serious projects using virtual worlds can be done.

Another fact supporting this is the participation of the journalist and writer Rosa Montero, translated into over 20 languages, with many awards and recently named Honorary Doctor for the University of Puerto Rico.

CONCLUSIONS

The preparation, planning and development of the exhibition "Women, Art and Power", has required a laborious work, attention and a great discipline for prevent any inconvenient.

Although the project was oriented to Second Life community, to approach them the social debate about the paper of the women in art and bringing them real life artists, we also know about other people that was following our events outside this metaverse and others that became new Second Life's users just to see this exhibition and attend some events related, as Rosa Montero's book presentation.

Due to this, we can conclude saying that metaverse platforms can be used to highlight the paper of the women in history and present time, in this case, "Women, Art and Power", in art history, doing activities that open a social debate about through metaverse users, and non users.

Also it's clear the importance and great significance of metaverse technologies in the fields of art, culture, science, education... and the great potential that has to establish professional and personal relationships.

EVALUATION

As whenever the MKAC realizes a project of this importance, it realizes and evaluation of the project (self-analysis and self-criticisms) based on quantitative and verifiable data.

While it is true that subjective data, (as congratulations, encouragement, demonstrations of affection...), are important, especially on a personal level, when performing a project, the true dimension of social and media impact of project is given by the objective data.

After analyzing the data and study objectives, the management of the museum believes that, although any subsequent project has to be improved, the experience with "Women, Art and Power" has being very positive, encouraging us to develop more projects.

PHOTO AND VIDEO MATERIAL, BLOG, FORUMS AND CONTACT:

AUDIOVISUAL

http://www.youtube.com/watch?v=OWQgqJXnU0k

PHOTOGRAPHY (MKAC's Flickr):

http://www.flickr.com/photos/48492520_@_N03_/

http://www.flickr.com/photos/museo_karura/

BLOG

http://mkac.wordpress.com/

FORUMS

http://foros.secondspain.es/component/option,_com_joomlaboard_/_Itemid,_100/func,_showcat_/_catid,_27_/
http://www.irenemuni.com/foro/museo-karura-art-centre-eventos-y-actividades-vt1582.html

The use of Second Life in the teaching of religion: a case study in the monotheist religions teaching

Fernando Cassola Marques
Universidade Portucalense
fernandocassola@gmail.com

Fernando Moreira
Universidade Portucalense
fmoreira@upt.pt

Abstract

In this time of technology along with all the social changes brought by, also in the teaching/learning processes we can see nowadays how useful it is to break with the old school model and to adapt the traditional curricula to a brand new generation of students, who are perfectly aware of this digital world.

According to this idea, some research that is being made in the educational field using didactic games, 3D platforms and settings can predict a powerful tool, since these virtual immersive 3D settings will become the most common way to meet one another, both in distance learning and business.

Therefore, we used one of the most common 3D platforms, the Second Life (SL), to study its use for religious teaching. The following goals were defined: verify if the SL can be used in the educational context; identify the advantages and disadvantages in using the SL for teaching purposes; analyze how useful it is for a brief overview in the monotheist religions teaching.

For this purpose we carried out a case study, during 3 different lessons and involving 4 different grade classes. At the end students were asked to answer a questioning. The results obtained are quite positive showing a wide range of opportunities for future usage and implementation of this kind of 3D and virtual world material, such as Second Life.

After analyzing this study and observing the results we can assume how promising these results are, as it seems to enable a wide use of SL in the teaching of religion. It is clearly an open field for the development of any other kind of activities using it. Finally, our study is quite short and unpretentious comparing to what we believe the full potential of this virtual world platform can do.

Keywords: Second Life, Virtual Worlds, Religion, Education, 3D Platforms, Teaching, research, learning.

Introduction

In the so-called revolution in information technology emerged in the late twentieth century, we now live in "a period characterized by the transformation of our cultural material, created by a new paradigm organized around information technology." (Castells, 2005, p. 33) As Negroponte wrote (1995), we live in a world that became digital. Therefore, the "information technologies are not simply tools to be applied, but processes to be developed" (Castells, 2005, p. 37). So, it is natural that in the teaching and learning process it will be necessary to move on from the traditional model of education, and consequently the adaptation of curricula and practices to a new generation of students who are perfectly aware of this digital world.

Traditionally we can say that the internet is a way of communication and socialization, gaining every day a greater number of supporters (Santos, 2010, p. 44). The multiplicity of tools and contents in the virtual space offer a wide range of possibilities and a feed the needs of the vast majority of its customers, as they have at their own disposal the potential of web 2.0 tools and, among other things, virtual worlds. In this sense, the use of virtual platforms starts to be seen by several authors as the future of human interaction in the network globalized world (Zhu, Wang, & Jia, 2007).

The use and implementation of virtual worlds in educational context dates back to 1970 (Livingstone, Kempb, & Edgar, 2008), but the researches and studies on the use of 3D virtual platforms in education have been developed over the past two decades (Lucia, Francese, Passero, & Tortora, 2008). Many educators are using virtual worlds for various reasons (Inman, Wright, & Hartman, 2010). There are already numerous experiments that have been developed using virtual worlds in education, from architecture, biology, medicine, geography, history, arts, learning languages, astronomy, science, computers, etc. (Valente & Mattar, 2008, pp. 194-210) In fact, the main Universities all over the world have a virtual and active presence in Second Life ® (SL). This does anticipate the enormous educational potential.

These environments allow a huge amount of experiences that are often difficult to find them in the real world (inside or outside the classroom). Whether due to economic conditions or restrictions of time and space, these platforms become a great resource for teachers. Specifically and particularly for this study, these virtual worlds allow you to explore and move to various places that would otherwise be almost inaccessible, or at least would be very difficult to move a group of people in a short space of time for these destinations.

This article presents a case study using a 3D platform most used and studied in an educational context, the SL, in order to understand its use in the teaching of religion.

Later there will be a theoretical approach to the use of virtual worlds in education. The following section will present the case study developed with students from the 2nd, 3rd and 4th grade in a Portuguese public school. This study is divided into four areas that will work on the different moments of application of this study of the field. Finally, conclusions and some clues for future studies are presented.

Some theoretical ideas about the use of the virtual worlds at school

Second Life® in education

Second Life ®, along with many other "virtual worlds, are not themselves games" (Austin & Boulder, 2007). It is a tridimensional, free and multi-user platform (3D). It is only necessary to have a personal computer with the application installed and a broadband connection to the Internet. As mentioned earlier about virtual worlds, SL is an immersive environment and fully envisioned, designed, built and maintained by its own users (residents - avatars). We can also mention that can be a real life simulator, allowing all kind of experiences and studies in a heavily regulated and secure environment, only limited by ones' imagination. (Mattar, 2008)

The verbal and nonverbal communication promoted by SL in real time (chat, voice, private messages, gestures, expressions, etc.) allows to teaching a class, since collaboration and instant sharing of content, coupled with the communication factor, enhance interactivity. (Loureiro & Bettencourt, 2010)

In addition to the potential of this tool, there are also some technical and even structural constraints. The first is directly related to the PC characteristics, since it demands for a computer with graphics card and processing capacity, as well as internet broadband, which can discourage and restrict general access to all people. In addition to these constraints there is a condition which, according to David Kirkpatrick (2007), only one person out of six keeps on going to the virtual world after the first month.

The case of the use of virtual worlds in teaching religion

After several months of research and investigation in a variety of platforms and scientific databases, we may indicate a scientific study that was developed within the same theme (Farley, 2010). At the same time it is possible to indicate some academic work that is being implemented on the ground, but that deals with the issue of virtual worlds and religion, apart from the educational issue. So, we can conclude that this area has been poorly investigated and this may be so because these are two issues that generally can be considered antagonistic. However, if you look at the issue of religious education as part of history and world culture, it is easy to see that the SL can and should be used in this context, as it is perfectly adaptable.

The work done by Helen Farley (2010) is the only one that comes closer to this paper. This project was originally conceived in 2007 and developed through 2008. It consists of a Second Life island situated in the New Media Consortium educational precinct and boasts a number of religious builds including a church, a mosque, a synagogue, an ancient Greek temple, a Freemasonic lodge, a Zen Buddhist temple and a Hindu temple to Ganesha. The island was used in two large first year classes and for supervising distance postgraduate students.

After finishing that investigation project, they conclude that, “the UQ Religion Bazaar island in Second Life provided the venue for group role-play activities designed around constructivist principles for first-year studies in religion students at the University of Queensland. Even though a formal evaluation of learning outcomes and perceptions was not undertaken, informal evaluation consisted of classroom observations and informal discussions throughout the courses under consideration. Though students were frequently frustrated by the technical aspects that interfered with

the execution of the assigned tasks in the supervised Second Life sessions, some reported feeling a sense of identity with the their avatar and an increased understanding of how it feels to belong to another religion (or to a religion). These students also reported that they believed that these activities would increase their understanding and tolerance of those of another religion". There are others interesting things, but we specially identify two cases:

1- The first conclusion is that the students did not have enough lab time to adequately prepare for the role play on Second Life. So, on the next classes they will add one more week.
2- One other conclusion is that they were planning to continue with this project, for example in the course "Introduction to World Religions", but improving some variants of the role-play model used. It's a very interesting conclusion, because that was the main theme about our project, to make the students to comprehend and understand some basic things about the great world religions.

As we have just examined, the study gains encouraging results, showing that there is a large amount of thematic material to be explored. Based on this we then decided to conduct the present case study. We also cannot ignore the reduced investigation on this topic, both nationally and internationally, addressing even a higher relevance to these studies.

The case study - practical application

After examining the use of virtual worlds in education and an explanation of the various capabilities of Second Life for teaching, it was decided to conduct a research project. So we defined the following goals:

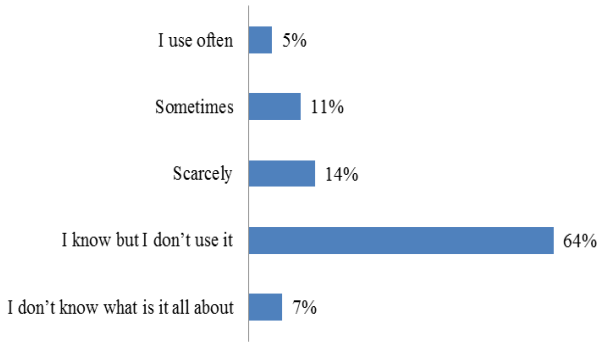
1. Check if the SL can be used in an educational context, teaching the monotheistic religions;
2. Identify advantages and disadvantages of using SL in teaching the monotheistic religions;

3. Planning for future investigations using SL in teaching the monotheistic religions.

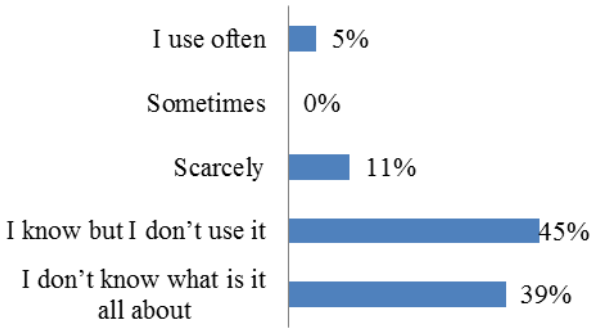
Therefore, as a way to achieve our goals, we performed a case study on four groups of different years (2 groups in the 9th grade (15 years old), a group in the 10th grade (16 years old), a group belonging to the 11th grade (17 years old), who were enrolled in the course of Moral Education and Catholic Religious (EMRC) in the Portuguese public school. The range of students consisted of 44 individuals, divided on 32 female and 12 male elements, coordinated by two teachers.

Introduction to the Second Life

On the first lesson, as a starting point, we considered important to know better the students that would collaborate with us in this study. So it was decided to carry out a first investigation on some issues related to the discipline of EMRC, Computers, ICT and SL / Virtual Worlds. Since it was not possible to go further on all the answers, we will only show those that are considered most relevant for the present work. The same methodology will be followed for the presentation of the results on other questionnaires.



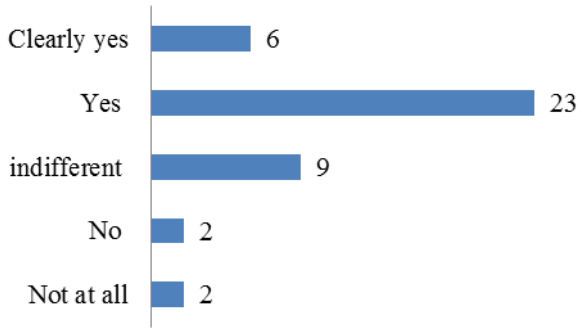
Graph 1 - Have you heard about virtual worlds?



Graph 2 - Do you use Virtual Worlds (SecondLife, OpenSim, ReactionGrid, Heritage, BlueMars, Habbo, etc.)

Analyzing the results about virtual worlds, although only 7% of the interviewees said they did not know that name at all, 64% of them knew but never used it (Graph 1), which does makes us believe that we were before an audience that would deal with a completely new content. Finally it can be stated that only 5% of students are using virtual worlds (Graph 2). Again we verified the scenario of complete unawareness of the concepts underlying platform and virtual worlds was present in the audience. So, after the original investigation, a presentation on the virtual platform SL was held. The goal was to explain what the SL was in general, using some clear examples of practical application on the use of the SL in a variety of settings.

At the end of the session, there was a final evaluation to see what the level of receptivity to the SL language was and the methodologies used, as well as the sensitiveness to understand what the SL is.



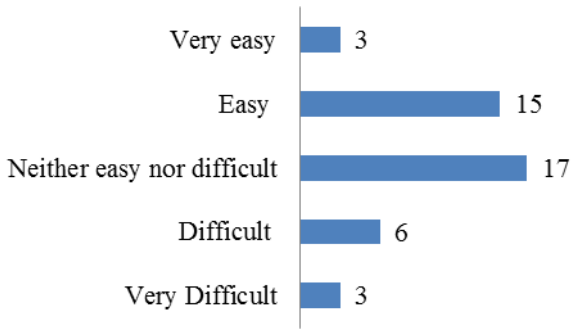
Graph 3 - After the lesson were you willing to use Second Life?

In this picture above we can see that 72% of students accepted the use of SL, because it was considered very positive, and it also shows that the presentation on the SL was almost clear to everyone and very motivating.

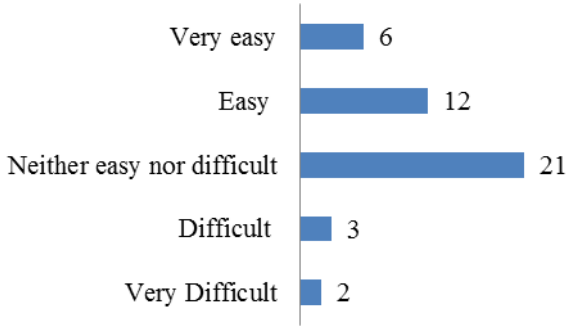
First steps on Second Life

On the second lesson due to the limitations imposed by the network technology in this school, students could not create their own accounts in SL. So we previously created group accounts for all students. Therefore, the next step was to explain the basic movements of navigation in SL, using a video made in SL and a presentation. There was still time for the students to experience and try some of these exercises. We created small groups (3 / 4 according to the class groups), which was given a text file (note card) with the exercise they would have to perform. In this exercise students should use one of the avatars of one of the group members, and had to travel through the places previously written in the note card, which took them to five different religious spaces. So, each group had to identify each space with each of the five faiths and also to indicate the correct symbol associated with the correct religion.

The results of this exercise revealed that most groups (80%) could identify the religions present in each island in the SL and that those who do not hit any location, was mainly because the lack of time to better explore that specific religious island. At the end of the lesson, students completed a survey, resulting in the following results:



Graph 4 - It was easy to identify the locations (islands) with the respective religion.



Graph 5 - Can you better understand the symbols of the following religions, through visiting their islands?

Through the analysis of the graph 4, where it was possible to obtain information on the identity of the island, it revealed that 42% considered it easy to identify the sites with the respective religion, 38% didn't find it neither easy nor difficult and 20% found it difficult. These data may indicate that students, upon the contents presented on each island, had some difficulty to identify, however it drew our attention the fact that most of the islands represent actual physical locations. Finally, it was stated that 13% had difficulty in understanding better the religious symbols through the SL; and finally we can also assume that 46% think the use of the SL for this purposes is indifferent (Graph 5). It is interesting to note that with these data, we can already set on what features the islands of religions should have. Clearly the contents presented in these days are not enough for the vast majority of visitors, which reveals that the spirit of acceptance is still very low. Eventually means of identification and interactive training must be used that lead the avatar to easily understand the places, history and the respective religious and theological foundations of each place. However, after all, as we indicated earlier this time, the vast majority of them could identify the island and was also able to identify groups with the respective religion.

Discovering the Second Life

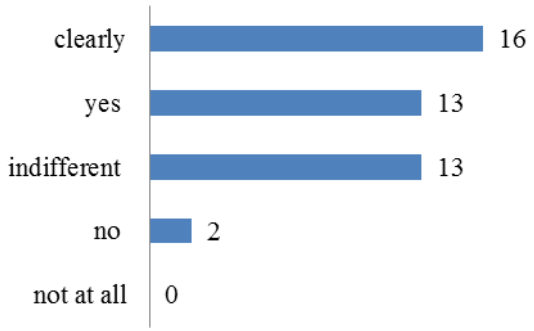
On the third and last lesson a final formative work was held, which for the 9th grade groups consisted to answer to a set of questions on each one of the religions. And for the older classes, instead of answering these same questions they were asked to give a presentation where the answers to these questions were presented. Please note that

these methods have been previously agreed with the teachers of the discipline, which served as a final evaluation of programmatic data to the module at these sessions.

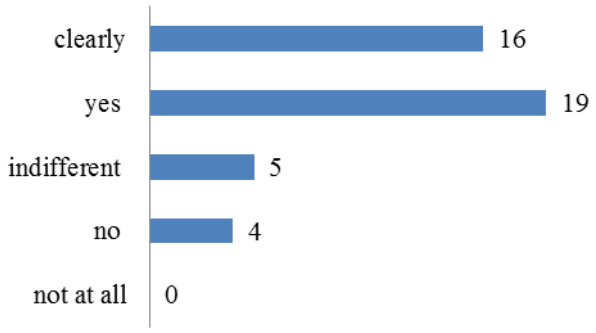
For those students in the 9th grade, was distributed to each small group a note card with a certain religious place, as well as the questions that students would have to answer moving around the island and interact with everything they considered relevant. For the older students, the task was a group work, answering to a set of questions using the SL and also they should take some virtual graphics (photographs, data, etc..) to start a presentation at the end of the class to comment on the results to the other colleagues.

At the end of this lesson, we found that students performed the tasks with great accuracy and above all with high motivation, commitment and spirit of research. It was unanimously certified by the teachers that all students revealed to be able to complete the module on the 5 major monotheistic religions successfully in terms of knowledge.

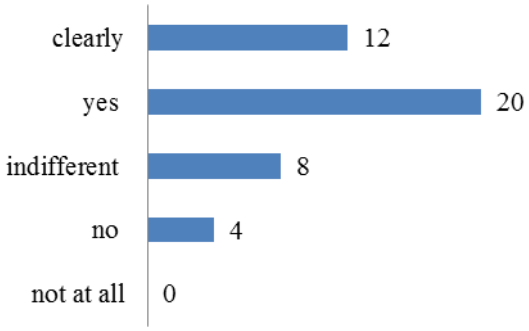
At the end of the group work, all students were asked to complete a final survey, from which we extracted the following results:



Graph 6 - Was I more aware of the issues studied because it was used the Second Life?



Graph 7 – Do you think it is possible to use the Second Life in the discipline of EMRC?



Graph 8 – Will you recommend the use of Second Life as a learning tool in the classroom?

Analyzing the data in Graph 6, 68% of students indicate that they were more focused because the subject was given in SL, yet 12% indicates that they were not focused at all. This data is also very positive for using SL in the formation context, for instance when most teachers complain the lack of motivation and attention from their students, this platform along with rich contents, fades completely the theory out that present students are shortly interested, unmotivated and inattentive.

In the Graph 7, 79% of students would give a five stars evaluation to the use of SL in the discipline of EMRC, which will reinforce the idea presented in the previous two graphs. On the other hand, 72% would strongly recommend the use of SL as a learning tool in the classroom.

The questionnaire had some issues that have to do with the difficulties found along the three classes; facts that can be seen in Table 1.

What were your greatest difficulties in using Second Life in the classroom?	
a. We were constantly without internet connection	18%
b. Problems logging in Second Life (login and password)	14%
c. Difficulty in moving the avatar	9%
d. Problems in finding interesting content on the islands visited	16%
e. Second Life was too slow to load graphics	7%
f. I had no trouble, or if I did it was easily overcome	34%
Other	2%

Table 1 - Difficulties in the use of SL in the classroom

As shown by analyzing Table 1, only 34% of students do not feel any difficulties or if they felt these were quickly overcome. This will lead us to the conclusion that 66%

of the students, the vast majority, felt some constraints on the use of SL. Searching deeper for the results, is was also found that 39% of students had eminently technical difficulties (network failure, slow machines, login error, etc..). The remaining 27% have felt problems in the interaction with the platform. However, it is not possible to assess which of those who had technical problems, there were also dealing problems with the the SL. It is clearly a gap that has not been investigated accurately and we are left without any answers to these students.

The opinion of teachers of the EMRC subject

After the 3 lessons, teachers were asked to answer a questionnaire about the three sessions attended. Because these were wide theme questions, we only transcribe those that are considered to be the most relevant for this study.

- Strengths and limitations of using SL in their discipline? "As a global education, the SL can be a way to explore that becomes in a planned manner but only momentarily, that is, one should not use it in a systematic and intensive way, nor exclusive; As a great potential, I see the possibility of students to do research on various subjects, with the possibility of contacting the realities (religions) next to its origin or from whom promote and publicize them. The limitations are due to the fact that students still have short familiarity and the bad quality of the Internet offered in the school. "
- What were the most interesting activities throughout the sessions? "The first time contact with the various virtual/real spaces that illustrate the contents. The possibility to talk live between all the elements inside or outside the classroom and other people that was also visiting the same island at the same time."
- Main shortcomings to this type of training activity: "Little pedagogical dissemination" of the spaces already created, and eventually an under-usage of these resources for teachers, non-availability of a specific classroom (ICT) with all the important material and necessary resources; it should be an occasional activity and not a dynamic and every day system."

Conclusions

With the present work we can prove the usefulness and use of virtual worlds as a potential pedagogical teaching tool. Although, since after many different studies have presented this digital platform as having a high potential in the educational context, there are still some prejudices and even structural barriers to its use in the classroom. But as explored in the theoretical component of this work, there are indeed reasons for more than evident that virtual worlds will become a reality in education, despite some technical constraints that can be observed both in theory and in practice, but are easily surmountable with advancing technologies.

In the case study we brought here, we can easily see that the SL potential overcome any technical difficulties that may arise. Both in terms of motivation, commitment, the seriousness with which students approached this project and to the level of acquisition and understanding of content, using the SL in the context of formation, as can be demonstrated, it is clearly a great choice.

One identified gap was the need for more time for users in order to explore the islands visited, and the contents learned. On the other hand, as the survey presented, it was necessary to have more attention to the problems exposed by the users.

It was also possible to see that, although there are a lot of content available on the virtual platform used, the level of religious education, much is yet to be done and created. Existing resources are scarce and make the users of these worlds have enormous difficulties in deepening their knowledge of the religions studied. This is definitely a point that should be taken into account in future works. It also required the implementation of new islands, or any substantial improvement of existing ones as a way of answering to the rise of the avatars that navigate in these worlds.

Bibliography

Austin, T., & Boulder, C. (2007). The Horizon Report, 2007: The New Media Consortium.

Castells, M. (2005). *A era da informação: Economia, Sociedade e Cultura - A Sociedade em Rede* (Vol. 1). Lisboa: Fundação Calouste Gulbenkian.

Farley, H. (2010). *Teaching first-year studies in religion students in Second Life: UQ Religion Bazaar*. Paper presented at the Curriculum, technology & transformation for an unknown future - Proceedings ascilite Sydney 2010, Sydney. http://www.ascilite.org.au/conferences/sydney10/procs/Farley-concise.pdf

Inman, C., Wright, V. H., & Hartman, J. A. (2010). Use of Second Life in K-12 and Higher Education: A Review of Research. *Journal of Interactive Online Learning 9*(1), 44-62.

Kirkpatrick, D. (2007). Second Life: It's not a game Retrieved 12/10/2011, 2011, from http://money.cnn.com/2007/01/22/magazines/fortune/whatsnext_secondlife.fortune/

Livingstone, D., Kempb, J., & Edgar, E. (2008). From multi-user environment to 3D virtual learning environment. *ALT-J Research in Learning Technology, 16*(3), 139-150.

Loureiro, A., & Bettencourt, T. (2010). *Ambientes Imersivos em contextos de aprendizagem – abordagem conectivista*. Paper presented at the Proceedings of the XVIII Colloquium of AFIRSE/AIPELF – Education Institute, University of Lisbon. http://ipsantarem.academia.edu/acccloureiro/Papers/498413/Ambientes_Imersivos_em_contextos_de_aprendizagem_-_abordagem_conectivista

Lucia, A. D., Francese, R., Passero, I., & Tortora, G. (2008). Development and evaluation of a virtual campus on Second Life: The case of SecondDMI. *Computers & Education, 52*(1), 220-223. doi: 10.1016/j.compedu.2008.08.001

Mattar, J. (2008). O uso do second life como ambiente virtual de aprendizagem. *Revista de Educação à Distância, 8*(95), 88-95.

Negroponte, N. (1995). *EL MUNDO DIGITAL* (M. Abdala, Trans.). Barcelona: Ediciones B, S.A.,.

Santos, A. L. S. (2010). *A INTEGRAÇÃO EM GRUPOS NO SECOND LIFE® E O PROCESSO DE APRENDIZAGEM*. Mestre, Universidade de Aveiro, Aveiro. Retrieved from https://ria.ua.pt/bitstream/10773/1425/1/2010000840.pdf

Valente, C., & Mattar, J. (2008). *Second Life e Web 2.0 na educação - o potencial revolucionário das novas tecnologias*. São Paulo: Novatec Editora.

Zhu, Q., Wang, T., & Jia, Y. (2007). *Second Life: A New Platform for Education*. Paper presented at the First IEEE International Symposium on Information Technologies and Applications in Education. http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=4409270

Poster Presentations

Virtual Worlds as a Collaborative Trainning Platform: F-16 engine installation scenario

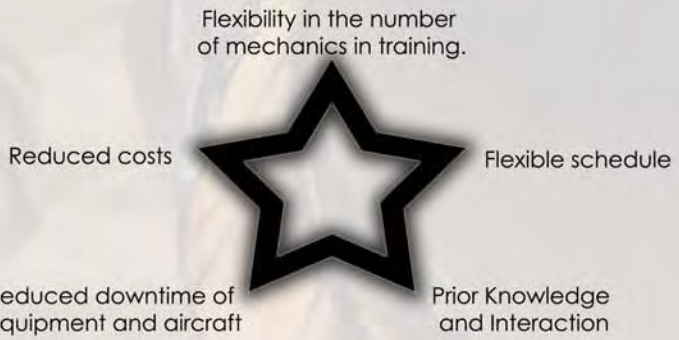
André Pinheiro[1], Benjamim Fonseca[2], Hugo Paredes[2], Lt Jorge Rafael[3], Leonel Morgado[2], Paulo Fernandes[1] and Paulo Martins[2]

[1] UTAD – University of Trás-os-Montes e Alto Douro, Portugal
[2] GECAD/UTAD – University of Trás-os-Montes e Alto Douro, Portugal
[3] Força Aérea Portuguesa – Base Aérea N.º5, Serra Porto de Urso, Portugal

Objective

Implementation of a Training System with 3D multi-user support for simulation of the installation of engines

Goals



Used Tools

- OpenSimulator → Development of the 3D environment
- QAvimator → Creation of the mechanical movements on 3D environment
- Microsoft .net → Control and Decision System: Hierarchical State Machine

Developed Work

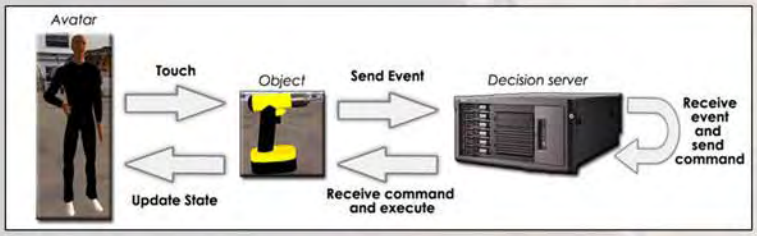
Creation of a script in LSL (Linden Scripting Language) common to all 3D objects, providing View-like operation under the Model-View-Controller architecture

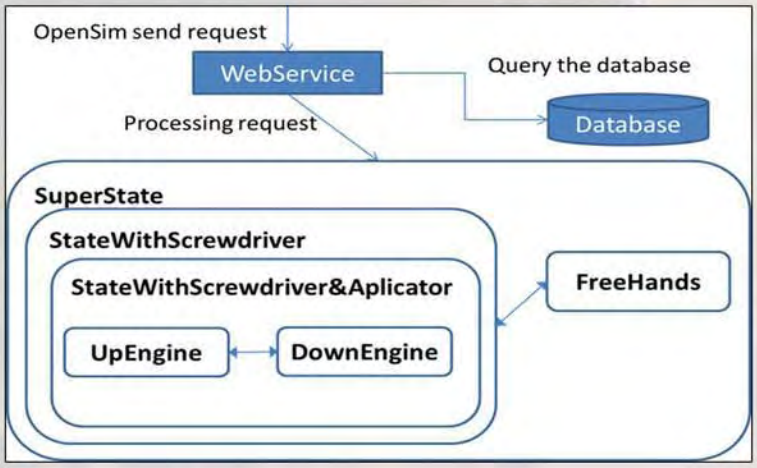
Modeling of 3D objects

Creation a decision-making system (hierarchical state machine with a database)

Creation of protocols for event reporting, issuing commands to 3D objects, and relaying commands amongst 3D objects

Architecture





Future Work

- Applying intelligent agents to these scenarios, to allow training with a variable number of human mechanics.
- Connection with Moodle

Slactions2011

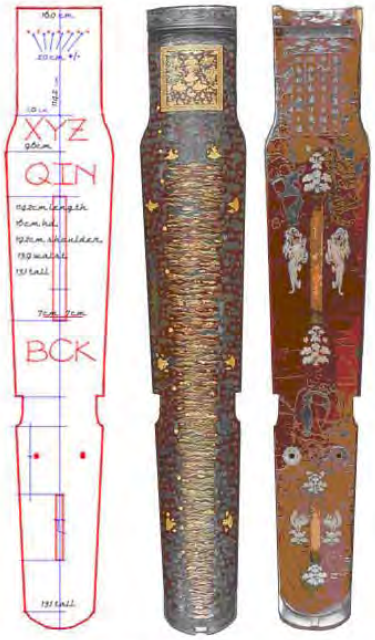
Creation of the xyzQin: an interpretation and re-creation of the Shosoin qin (金銀平文琴) Tang Dynasty (735 AD) ; Shosoin Treasure House, Japan :: from rl -> sl -> rl.

Shuen-git Chow 周 旋 捷 2011
Visiting Associate Professor,
Tainan University of the Arts,
Taiwan

Description:
In this research-creation the third in the serie of Digital Guqin Museum Project - we will investigate issues concerning the making of a real life Chinese musical instrument: the seven string zither - guqin - by deploying VirtualWorld 3D construction capacities, first building it the traditional way, and then import the model to VW, then re-export the data into a limited series robotic fabrication system in real life. I will design a new guqin after the all-over decorative skin of the Shosoin qin, tentatively named the "xyz琴" (xyz Qin)

Part I: real life xyzQin prototype
1// creation of the pattern
2// wood embryo formed
3// tuning and refinements
4// lacquer and engraving, inlaid
5// fine polish

Technical advisors:
Master guqin player: Sik ChingChiek
Master guqin maker: Mr.Shan Shi yuen



Shosoin Qin

To investigate the feasibility of DIY qins -design and make - using FabLab type small series fabrication, 3D printers, 3D modelling systems from a Virtual World to the Real World.

Guqin, the Chinese instrument is usually made the traditional way - by hand - carving wood planks into a wooden embryo, fine tuning, finish with layers of lacquer and much polishing. This method is lovingly time consuming and costly.

Would it be possible to cut the toiling time down - where possible - and still have a precious instrument?
To continue a tradition; keeping it alive with hopes of developing the art with new excellence, we must have a base of large numbers of players engaged in the art.

The -xyzQin- is an effort to explore high quality and affordable instruments for people who are interested in the guqin. I propose to make a test and compare the final VirtualWorld Design to RealWorld output via the xyzQin - the creation of a new qin based on an original museum piece - the Shosoin Qin.

http://shosoin.kunaicho.go.jp/shosoinPublic/img/content/CO0000000354/slide.jpeg
http://swannbb.blogspot.com/2011/10/slactions2011-xyz-qin-shosoin-qin.html

Conference Programme

Conference Programme

Welcome address

First Paper Session

Effectiveness of virtual world timers in educational physics simulations

Expeditious creation of multiplayer games for Second Life and OpenSimulator virtual worlds

Concert by Pedro Chamorro & Francis García

Second Paper Session

The American Dream: Narratives of space and place in Second Life

Visual perception in metaverses: Consuming advertising through the avatar's eyes

"Women, art and power", International Women's Day, March 8, 2011

Poster presentations

Final Remarks

Local Chapters and Committees

Local Chapter

Hong Kong, China

CoreSL – HK PolyU in Second Life,
The Hong Kong Polytechnic University,
Hung Hom, Kowloon, Hong Kong.

http://slurl.com/secondlife/HKPolyU%20Campus/178/166/25/

CoreSL-Project Team

Dr. David Kurt Herold (Team Leader)	ssherold@inet.polyu.edu.hk
Dr. Vincent Ng(Team Leader)	cstyng@comp.polyu.edu.hk
Mr. Peter Duffy	etpeterd@inet.polyu.edu.hk
Mr. Newman Lau	mcnewman@inet.polyu.edu.hk
Ms. Mei Li	lbmeili@inet.polyu.edu.hk
Ms. Chloe Lau	hmchloe@inet.polyu.edu.hk
Ms. Gigi Ay Au Yeung (Project Manager)	egigi@inet.polyu.edu.hk
Mr. Bill Liu (Project Designer)	shineyu.as@gmail.com

Website

http://coresl.edc.polyu.edu.hk/

Local Chapter

S. Paulo, Brasil

Pontifícia Universidade Católica de São Paulo,
Campus Marquês de Paranaguá,
Rua Marquês de Paranaguá, 111,
Consolação - São Paulo – SP,
CEP: 01303-050,
Fone: (11) 3124-7200

Local Committee

Donizetti Louro (Chair) **donlouro@gmail.com**

Organising Team

Daniel Gatti
Luciana Louro
Mauricio Pontuschka

Website

http://www.pucsp.br/

Local Chapter

Madrid, Spain

Rey Juan Carlos University,
Fuenlabrada Campus,
Faculty of Sciences Communications,
Graduate Hall - Departmental Building I,
Camino del Molino s/n.,
28943 Fuenlabrada. Madrid (Spain)

http://maps.secondlife.com/secondlife/Bay%20Islands/25/82/21

Local Committee

Teresa C. Rodríguez (Coordinator)	**teresa.rodriguez@urjc.es**
Sergio Álvarez (Secretary)	**sergio.alvarez@urjc.es**
Miguel Baños (Secretary)	**miguel.baños@urjc.es**

Ciberimaginario Research Group

Website

http://www.ciberimaginario.es/
http://www.ciberbabia.wordpress.com/

Local Chapter

Lima, Perú

Universidad de San Martin de Porres (USMP)

USMP on Virtual Worlds Research Group
http://aula3.usmpvirtual.edu.pe/secondlife/

Local Committee

Frank Casas Sulca (Coordinator)	**fcasas@usmpvirtual.edu.pe**
Fernando Pascual	**fpascual@usmpvirtual.edu.pe**
Marta Sanz	**msanz@usmpvirtual.edu.pe**
Liliveth Mendoza	**lmendoza@usmpvirtual.edu.pe**
Niger Arce	**narce@usmpvirtual.edu.pe**

Website

http://www.usmp.edu.pe/index.php

Local Chapter

Portugal

University of Tras-os-Montes e Alto Douro (UTAD)
School of Sciences and Technology

http://slurl.com/secondlife/UTAD/245/208/38/

Local Committee

Leonel Morgado (Chair)	leonelm@utad.pt
Benjamim Fonseca	benjaf@utad.pt
Hugo Paredes	hparedes@utad.pt
Paulo Martins	pmartins@utad.pt
Ana Margarida Maia	margaridam@utad.pt
Goncalo Cruz	goncaloc@utad.pt
Daniela Pedrosa	daniela55pedrosa@gmail.com
Paulo Fernandes	pklides@gmail.com
Ricardo Rodrigues Nunes	rrnunes@utad.pt

Website

http://www.utad.pt/

Committees

General Chairs

- Ana Boa-Ventura, University of Texas
- Leonel Morgado, Universidade de Tras-os-Montes e Alto Douro, Portugal
- Nelson Zagalo, University of Minho, Portugal

Programme Committee

- David Herold, Hong Kong Polytechnic University, Hong Kong
- Vincent Ng, Hong Kong Polytechnic University, Hong Kong
- Gigi Ay, Hong Kong Polytechnic University, Hong Kong
- Peter Duffy, Hong Kong Polytechnic University, Hong Kong
- Dean A.F. GUI, Hong Kong Polytechnic University, Hong Kong
- Newman Lau, Hong Kong Polytechnic University, Hong Kong
- Mei Li, Hong Kong Polytechnic University, Hong Kong
- Chloe Lau, Hong Kong Polytechnic University, Hong Kong

Scientific Committee

- Ana Boa-Ventura, University of Texas
- Antonio Ramires Fernandes, University of Minho, Portugal
- Augusto Abade, Universidade de Coimbra
- Benjamim Fonseca, UTAD, Vila Real, Portugal
- Dr. David Kurt Herold, Hong Kong Polytechnic University, Hong Kong
- Dean A.F. Gui, Hong Kong Polytechnic University, Hong Kong
- Donizetti Louro, Pontificia Universidade Catolica de Sao Paulo - PUC SP, Brazil
- Hanan Gazit, PhD, Shenkar College of Engineering and Design, Israel.
- Hugo Paredes, Universidade de Tras-os-Montes e Alto Douro (UTAD), Portugal
- Joao Varajao, University of Tras-os-Montes e Alto Douro, Portugal
- Leonel Morgado, Universidade de Tras-os-Montes e Alto Douro, Portugal
- Luis Pedro, University of Aveiro, Portugal
- Marco Antonio Chavez Aguayo, University of Barcelona
- Dr. Margaret Nosek, Faculty at the Baylor College of Medicine (Texas Medical Center)
- Narciso Cerpa, Editor-in-Chief, JTAER
- Nelson Zagalo, University of Minho, Portugal
- Nuno Silva, GECAD & ISEP - IPP, Portugal
- Paulo Martins, University of Tras-os-Montes e Alto Douro (UTAD), Portugal
- Pilar Lacasa, University of Alcala Spain, Spain
- Teresa C. Rodriguez, Rey Juan Carlos University, Spain
- Dr. Yesha Y. Sivan, Editor, Israel
- Yin-Leng Theng, Nanyang Technological University, Singapore
- Teresa Bettencourt, University of Aveiro, Portugal

Published in 2012 by:
CoreSL – HK PolyU in Second Life
ISBN: 978-988-16411-2-0

The Hong Kong Polytechnic University 香港理工大學

Virtual Campus

http://coresl.edc.polyu.edu.hk/

School of Design

School of Hotel & Tourism Management 酒店及旅遊業管理學院

Educational Development Centre

PolyU Computing

LIBRARY