Virtual Tourism in Bruges: The Travel Guide

Philippe Kerremans
LouisPlatini.com
October 2007

Virtual Tourism in Bruges : The Travel Guide
An example of augmented virtuality.

Introduction

A part of the historical city of Bruges is reconstructed in Second Life. The goal is to let the residents of Second Life visit Bruges without being there (in the real world). This can be a preparation to a real visit of the town or as a second-best option if time, distance or money prevents the SL residents to visit RL ("Real-Life") Bruges.

To improve the virtual visit, a virtual tour guide is made. This guide is a HUD (Heads-Up Display) that the virtual representation of the visitor in Second Life, the avatar, should wear during the visit. When the avatar looks at a building, information and pictures about this building are shown in the HUD.

Virtual Bruges is a good example of Augmented Virtuality (AV); improving a virtual environment with real world information.

Augmented Virtuality

Milgram et al (6) have coined the term mixed reality (MR) environment, which is an environment where real and virtual are mixed to any degree. Other features of a MR environment are interactivity in real time and the existence of three dimensions (7).

Several "mixed reality" cities are constructed in Second Life, from which Amsterdam and Dublin are the most popular in Second Life. But not all of those MR cities are faithful reproductions of the real world cities. Often several important buildings are put together when in the real world they are not located in the same place. The purpose of these cities is to recreate a setting for entertainment, not to show an exact reproduction of the real world city. Moreover, little information is available about the buildings and monuments reconstructed in Second Life. Only in Dublin boards are available around the city to provide more information about the streets and buildings.

Other cities and buildings were constructed with the goal to provide cultural (tourist) information, such as the recent build of Chichén Itzá, a famous Mayan temple in Mexico.

Another term introduced by Milgram et al (6), Augmented Virtuality (AV), is the improvement of a modeled, virtual environment with real world information.

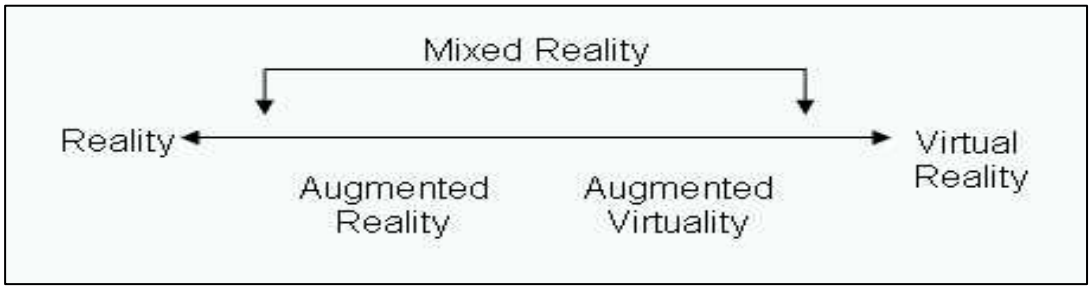

Fig 1. : The Reality-Virtuality continuum

Virtual Bruges is an example of a mixed reality environment, augmented or improved with real world information and pictures. The aim of Virtual Bruges is to provide tourist information about the real world city.

Virtual Tourism

Research by Mosaker and others (9), tourists want to share cultural perceptions and learn through doing, being told, observing, and asking. Also virtual tourists want to feel engaged in the activity by interacting inside the virtual environment (10). Reconstruction of building inside a virtual environment is not enough. There should also be some type of interactions. Interaction is possible by using the augmented reality systems in the real world and augmented virtuality applications in a virtual environment.

There are several projects that have researched the use of virtual reality for cultural applications.

Examples of augmented reality are the use of guides in a real world museum. Visitors of a real world museum can sometime hire a walkman that give descriptions of the cultural artifacts (paintings, sculptures, …) when they walk through the museum. In Italy, the National Research Council has developed a device, which functions much like a push-button dial on a telephone. However, instead of

dialing a telephone number, one will key in the painting or monument number to receive the desired description.

The above example is situation on the left side of the reality-virtuality continuum, e.g. improving a real world location with “virtual” information.

There are also examples of the use of virtual guides in virtual and imaginary museums. One of the oldest projects is the pioneering reconstruction of Cluny Abbey by IBM. The virtual environment of Cluny had a virtual guide or avatar, in the form of a mediaeval nun, who took one around the virtual reality model of the famous church.

Augmented virtuality is not only used for cultural purposes. For instance, at Columbia University, Steve Feiner (1) has been exploring the architectural implications of augmented reality in the context of engineering or architecture, e.g. Architectural Anatomy.(2) This mixed reality application allows one to view a virtual reality version of a room and then see the position of all the wires, pipes and other things hidden behind the walls.

Most of the augmented virtuality projects increase interest in seeing the original. The purpose is to prepare us to see the “real” building or artifacts. Only in the case of special sites such as the caves at Lascaux or the Tomb of Nefertari, will the new technologies serve as a substitute for seeing the actual objects in order to protect the originals.

The aim of Virtual Bruges is to be prepared for a real visit of the city. The purpose is not to be architecturally correct, but to give a “feeling” of what it would be in the real world. It is no replacement of a detailed or extensive travel guide.

Those not able to visit an actual city would still be able to do a virtual visit from their PCs even when far from major centers of culture. Seeing the original has and always shall be preferable to seeing surrogates. But those in remote areas are typically doomed to seeing nothing other than images in books. With the building of virtual cities, such as virtual Bruges, at least they will potentially have access to an enormous array of heritage wherever they happen to be.

Spatial Navigation

Knowing how to get there, spatial navigation, is one of the fundamental concerns in the organization and retrieval of all knowledge including culture. Recently, a very detailed reconstruction of Rome was made (11). The team noticed during the reconstruction that sometimes information was lacking to make a faithful reconstruction. Experts had to evaluate their research again before they could make a virtual presentation of certain buildings. The aim of Virtual Bruges was not to be scientifically correct, but to give potential tourists an impression of the real city. However, the fact that you can walk or fly through the reconstructed city, you get a unique perspective on the city which a classical (2D) travel guide cannot provide.

The spatial organization of building and monuments is an important aspect for the future tourist. SL residents, who know Bruges very well, recognized the buildings and places in virtual Bruges because the houses appeared there where she expected them.

Historical reconstructions of a city

Virtual Bruges is a reconstruction of contemporary Bruges. It contains many buildings that are more than 500 years old, but it shows their current situation.

From a cultural, scientific as well as a tourist perspective, a reconstruction of a city 100, 500 or 1000 years ago would be valuable and interesting for a variety of reasons.

Attempts were made the last years to make an historical reconstruction of cities, from which Rome is one of the latest large projects (11). Another reconstructed historical virtual city is reconstructing the mediaeval city of Bologna. This reconstruction uses the virtual reality modeling language (VRML) to walk through the streets and watch how they change as if one were in a time machine (3,4).

Consequently, we should not look at buildings as static entities, but something that changes in the light of different cultural and scholarly traditions. Therefore, it is important that the use of MR technologies in

virtual cities does not just present virtual buildings, monuments, other artifacts and their descriptions. They must be set in a story that reinforces the visitors learning and understanding of the cultural context.

The Travel Guide for Virtual Bruges

A HUD (Heads-Up-Display) is made that shows information of the building or place the avatar is looking at (see figure 2).

Figure 2: The avatar looks at a building and the HUD retrieves information about the house.

The position of each house is stored and when the HUD interrogates the database, the position of the avatar is send to the database. Information about the house that is the nearest to the position provided by the HUD is retrieved and send to the HUD.

The HUD is polling at a fix interval the position of the avatar and sending this information to the database. The information in the HUD is constantly refreshed without the need to interact with the HUD.

This combination of looking at 3D representations of building together with showing RL information and pictures makes the experience of

seeing and gathering information more immersive compared to a classical travel guide.

Conclusion

For virtual cities and museums to be successful and meaningful, more is needed than an accurate and realistic reconstruction. Several studies have shown that contextual information is more important than realism (8). As stated by E. Champion, “Not only do people learn through interaction, they learn through watching or inferring the interaction of others. And their interaction and traces of their interaction may interfere with the experience of others. We may or may not wish to see how people have tried to annotate, augment, or vandalize virtual places, but we may not want to be pushed around or obstructed by them” (8). The Travel Guide HUD allows people to annotate each building. All annotations are visible by all other visitors and in that way increase and improve the learning process.

The Travel Guide HUD is only a first step in the increase of interactivity in Virtual Bruges. E. Champion listed several requirements that should increase engagement of the visitors (9). Several of these requirements can be implemented in Second Life, such as giving the visitors tasks to complete, using guided tours and virtual guides that give answers to specific questions.

I hope that Virtual Bruges becomes a place where people can entertain, live and learn. The Travel Guide HUD hopefully is entertaining and helps the future “real-world” tourist of Bruges to find their way around in Bruges before even being there.

Future improvement might include tools and utilities that help the virtual tourists when visiting Bruges in RL, such as a hard copy of route including directions, GPS coordinates, notes made when being in Virtual Bruges, screenshots, etc.

I want to finalize with a comment given by one the singers of a live performance in Virtual Bruges, who said to be happy to be invited in Bruges. The singer was clearly aware of her presence in a specific place – and this should be the purpose of any mixed reality environment.

1. See: http://www.cs.columbia.edu/~feiner
2. See: http://www.cs.columbia.edu/graphics/projects/archAnatomy/architecturalAnatomy.html
3. See: http://www.csl.sony.co.jp/person/rekimoto/navi.html
4. Archeologia, percorsi virtuali nelle civilta scomparse, Milan: Mondadori Editore, 1996. This book has since been translated into French and English.
5. Interfaces for Cultural Heritage, Kim H. Veltman, in Frontiers in Conceptual Navigation for Cultural Heritage, Toronto: Ontario Library association, 1999.
6. P. Milgram and F. Kishino, A taxonomy of mixed reality visual displays, IE-ICE Trans. on Information and Systems (Special Issue on Networked Reality), vol.E77D, no.12, pp.1321-1329, 1994.
7. R. T. Azuma, A survey of augmented reality, Presence, vol.6, no.4, pp.355-385, 1997.
8. E. Champion. When Windmills Turn Into Giants: The Conundrum of Virtual Places. Technè 10:3, Spring 2007
9. R.L. Mosaker. Visualizing historical knowledge using VR technology In Digital Creativity S&Z 12:1 (2000)
10. E. Champion. Applying game design theory to virtual heritage environments. In Proceedings of the 1st international Conference on Computer Graphics and interactive Techniques in Australasia and South East Asia (Melbourne, Australia, February 11 - 14, 2003). GRAPHITE '03. ACM Press, New York, NY, 273-274. (2003)
11. Andrew Curry. 'Rome Reborn' Model Pushes Frontiers of 3-D Simulation. (2007) http://www.wired.com/culture/art/news/2007/06/rome_reborn