MUVI - A Virtual Museum of Daily Life: New Technologies for Supporting History and its Communication

M. E. Bonfigli* - A. Guidazzoli* - M. A. Mauri* - D. Semprini* M. C. Liguori** - D. Vasetti** - T. Diamanti*** - F. Serafini***

* CINECA, Visual Information Technology Lab
** Department of Historical Disciplines, Bologna University
*** VISMAN project, Bologna

ABSTRACT – *I Musei della Vita Quotidiana sono molto diffusi in Nord Europa ma non in Italia. Grazie alla Realtà Virtuale e alla Computer Grafica interattiva è possibile realizzare un Museo della Vita Quotidiana superando tutti i problemi legati alle esigenze di spazio e alla disponibilità di una collezione di mobili e oggetti.*

In particolare, il progetto MUVI, realizzato dall'Università di Bologna e dal CINECA e sponsorizzato in parte da "Bologna 2000", è costituito dalla ricostruzione di oggetti ed interni domestici validati da storici ed utilizzati come un'interfaccia per accedere ad analisi e a fonti storiche.

Il primo ambiente virtuale modellato è una casa degli anni '50, considerati come un punto di partenza significativo al fine di comprendere alcuni degli importanti cambiamenti verificatisi nella vita quotidiana del XX secolo.

Il progetto MUVI è visibile sia in Internet, per essere raggiunto da un vasto numero di persone, sia nel Virtual Theatre del CINECA, al fine di ottenere un alto livello di coinvolgimento.

Daily Life Museums, concretely executed and widespread in Northern Europe, are not very common in Italy. Using Virtual Reality and Interactive Computer Graphics we can set a Daily-Life Museum up overcoming all the problems related to spatial needs and availability of a collection of furniture and objects.

In particular the MUVI project, realized by the Bologna University and CINECA and partially sponsored by "Bologna 2000", consists of the development of 3D reconstructions of objects and domestic interiors authenticated by historians, used as an interface for accessing historical analysis and sources.

The first modelled virtual environment is a house of the 1950s, considered as a significant starting point in order to understand some relevant changes which have occurred in 20th century daily life.

The MUVI project is enjoyable both through the Internet (web virtual environment), in order to be accessed by a very large number of people, and in CINECA's Virtual Theatre(semi-immersive virtual environment), in order to attain a high level of involvement.

1. Introduction

Daily Life Museums are dedicated to the reconstruction of domestic interiors and the displaying of historical everyday life sources. Their main aim is related to the growing exigency of not dispersing the heritage of memory of things and people who came before us, which is less and less transmitted through a dialogue between generations.

In spite of their importance, permanent reconstructions are very expensive and demanding. Hence, new technologies seem particularly appealing, offering increasingly effective solutions and prospecting challenging opportunities. Permanent structures can be replaced by a digital museum that can be developed following different options (as the web and the immersive 3D visualization) and satisfy different exigencies.

These considerations are the inspiring starting point for the MUVI project, conceived in an historical framework and developed at CINECA thanks to a partial sponsorship by "Bologna 2000".

2. MUVI - a Daily Life Virtual Museum

The MUVI project - The Virtual Museum of Daily Life in the 20th century Bologna www.cineca.it/muvi - is about life in Bologna from the end of the 19th century up to today and consists of:

• a web site divided into four sections - Economic Life, Social Life, Political Life, Domestic Life - with texts, movies, eye-witness accounts, images and so on;
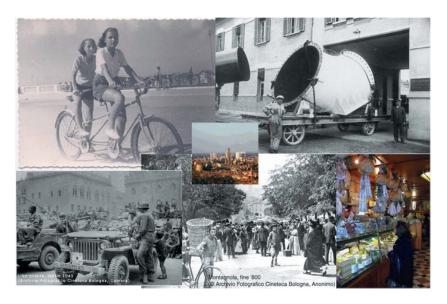

FIGURE 1. – *A collage made with some of the photographs: girls at the seaside in 1948; a turbine in 1920; 25 April 1945; a market area at the end of the 19th century; Bologna; a grocer's shop now.*

FIGURE 2. – *A snapshot of the Virtual Kitchen of the Fifties.*

- 3D reconstructions of domestic interiors, enjoyable in semi-immersive environments or through the Internet.

The MUVI project places itself as a collector of a disperse heritage of memory and the information gathered is filtered and checked by historians, who guarantee the authentication of the material and set the related analysis.

Multimedia data, resulting from the digitalization activity, are the basis for the modelling activities, granting the creation of "historically" authenticated three-dimensional reconstructions.

FIGURE 3. – *A snapshot of the Virtual Living-Room of the Fifties.*

FIGURE 4. – *A blender of the Fifties: the real object, the ad and the 3d model.*

The relations between multimedia data and 3D models are codified in a database using records structured on the basis of the Dublin Core metadata standard. The DC records and the 3D models are considered the input data both for interactive Computer Graphics and semi-Immersive Virtual Reality.

3. Modelling activity

The 3D reconstruction started from the kitchen (http://www.cineca.it/muvi/3d/cucina_frame.html) and the living-room (http://www.cineca.it/muvi/soggior-nointernet/soggiorno_frame.html) in a house from the 1950s and through which it is possible to study some of the most important changes occurred in every day life.

FIGURE 5. – *The domestic interiors of the Fifties have been realized starting from the floor plan of a flat still existing and built in 1957.*

We chose a middle class environment in order to have more displaying possibilities. Original objects were accurately measured, photographed and correctly modelled and texturized and documents and sources testify its "origin".

4. The 3D Interface

In the domestic interiors it is possible to have a real-time interactive walking navigation, flexible towards curiosities and specific interests of the audience.

Selecting virtual objects in the virtual kitchen it is possible both moving them and accessing the information. For example, selecting the fridge, people can visualize textual historical analysis explaining changes that followed the spreading of the fridge; photos of real 1950's fridges, advertisements and other sources used as an authentication of the virtual reconstruction. In this way the 3D model is not only nice and realistic, but also historically accurate.

4.1 *The Web application*

Along with the multimedia web site, another Web application has been developed. It consists of a VRML of the kitchen interacting with whom the user can obtain an hypermedia built dynamically on the basis of:

- the user's language: English or Italian;
- the user's cultural background: he/she can classify himself/herself as a tourist or as an expert obtaining different kinds of explanation);
- the user's interests: he/she can select which kind of sources has to be visualized (photos, ads, oral witnessing, etc.)

Travel and wayfinding are managed directly by the VRML browser Cosmoplayer; while the capability to select objects in order to obtain historical information is developed using JavaScript and XML.

4.2 *The semi-immersive application*

The virtual environment can be also enjoyed in the CINECA's Virtual Theatre.

The immersive chance has been considered suitable for the MUVI 3D application since domestic interiors are particularly valorised by the 1:1 scale fruition and the sense of immersion. Sitting in the chairs of the theatre and wearing stereoscopic glasses viewers can experience a semi-immersive virtual environment that appears to surround themselves enjoying simultaneously music, noises and voices that play a fundamental role in order to increase the involvement.

Navigation is realized both as a real-time interactive walking and as an automatic guided tour; a useful technique for providing the audience with a quick overview of the virtual environment and its objects.

FIGURE 6. – *The MUVI Web application*

At the beginning, the immersive navigation of the three-dimensional kitchen – designed using traditional software tools as 3DStudio – has been realized using VRML and Performer. Then, further areas of the house – entrance, corridor and living room – have been modelled using Multigen Creator. This software draws optimized 3D objects and has functions suitable for virtual reality: modelling in volumes, shadowing and texturing surfaces, connecting sound files, creating degree of freedom for animation and level of detail for a quick visualization. Creator has been used also to convert and optimize 3D Studio models of the virtual kitchen.

At present, Paradigm Vega is the visualization software used at CINECA's Virtual Theatre and VISMAN (a software created by a start-up project supported by the Spinner Consortium with Regione Emila-Romagna and UE funds) has been used for the desktop fruition. With both it is possible to compose and visualize the scene, make the rendering, create automatic and manual navigation in the scene, manage audio files etc; it is also possible to use the Pick function, which can link an object with web pages, images, sound, movies and interact with objects in the scene: open a door, turn on the radio etc.

The interaction with objects in the scene is very relevant for the educational use of MUVI because users can discover many information about the objects and their functions since the Pick function is used also to link MUVI Web pages to the objects in the scene.

The application has been tested during lessons to high school classes and in public events, demonstrating its communicative effectiveness.

FIGURE 7. – *The VISMAN desktop visualization: thanks to the Pick function it is also possible to interact with the objects in the scene.*

Publications

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