Daily Life in the Middle Ages - Parma in the Cathedral Age

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Abstract
This experience is the result of a close interaction between computer science and historical studies.
Technological knowledge and new tools for virtual reconstruction are not sufficient for Cultural Heritage philological works, but a close collaboration with historical experts is very important since the knowledge of both sciences have to work together in order for people to understand past civilizations.
The aim of this exhibition is to improve the perception of events in the Middle Ages.

Categories and Subject Descriptors (according to ACM CCS): J.5 [Arts and Humanities]: Architecture

1. Introduction

Effective three-dimensional historical scenarios have been created by the Cineca Visit lab for the exhibit "Vivere il Medioevo. Parma al tempo della Cattedrale - Daily life in the Middle Ages. Parma in the Cathedral age" which is currently taking place in Parma at the Pilotta Palace, from October 8th to January 14th.

An important aim of the exhibit is to communicate the experience of the daily life of common people in Parma in the Middle Ages.

In order to do this interactive Virtual Environments have been conceived as new media able to communicate complexity and to show to a wider audience the results of complex studies based on historical sources analyzed by experts, and to visualize also their different interpretations.

2. The methodology

The technologies and the skills in the field of Cultural Heritage developed by Cineca involve the use of Virtual Reality systems in order to generate, navigate, explore and inquire reconstructed historical environments, which are connected to databases and simulations whenever available.

In fact, our Open ViSMan framework (Open Virtual Scenarios Manager, developed on the open source graphic library OSG) has been designed in order to navigate complex reconstructed cultural scenarios characterized by different LODs (Level of Details), with each level representing an interactive graphic interface available to the user, enabling access to a corresponding database and providing if necessary a bi-univocal response: a graphical one inside the model and a traditional one as a response to a query of the database. [GF04]

This feature enables a user to make relationships between models and historical sources and the interpretations underlying the models themselves gathered under the same graphic interactive "roof" that unifies even apparently disjointed information usually provided by different cultural institutions such as Superintendences, museums, archives and universities and so on.

However, to reach the public emotionally involving spaces are necessary, i.e. spaces able to use 3D philological historical scenarios validated by experts, as new narrative spaces. [GDC*06]

Since the Open Visman framework has been designed with a high degree of compatibility with the Virtual Set technology working together with Studio Azzurro, a team of communication experts, a complete integration of the reconstructed models has been obtained within the multimedia emotional installations designed for the public. In fact, the medieval Parma Cathedral and Square philological models have been used by Studio Azzurro as digital scene pictures inside a virtual set where real actors following a screenplay, written in collaboration with the historians, played daily life scenes in the Medieval Square as well as religious ceremonies inside the three-dimension model of the Cathedral interior.

To sum up, the interaction with the Virtual Environments

allows the exhibit visitors to be immersed in a sort of hic et nunc, feeling a real involvement in a Parmesan medieval atmosphere and at the same time it allows them to understand and perceive better the context of the real objects such as manuscripts or artworks presented in the exhibit. In addition a reconstructed middle aged soundtrack creates a sort of perceptive glue among the installations and the objects.

3. Historical aspects and reconstruction proceeding

Three reconstructions were required and realized for a complete representation of daily life in the Middle Ages.

The first most important and binding three-dimension model is the inner part of the Cathedral, the second is a part of Garibaldi Square and the last one a kiln found in Parma's urban area.

The Cathedral reconstruction involved many researchers with different skills and many investigations of the remains of the medieval part; Massimo Fava [Fav06] and Fabrizio Tonelli [Ton06] in particular were the historical experts that guided this reconstruction. An essential phase of this work was a close collaboration with the historical experts and their studies continued even during this virtual reconstruction.

Our work has been carried out with a continuous information exchange between historical studies and virtual reconstruction: on one hand experts were stimulated in their studies by the virtual reconstruction, on the other hand their theoretical studies needed also a visual control that could better confirm them.

The first step of this work was the complete geometry reconstruction from historical studies (Figure 1). From this it is possible to see, for example, the different organization of stairs and also other elements that are not visible during a visit of the present day Cathedral.

Figure 1: *Cathedral seen from the nave*

These models cannot replace the existing structure but are useful for emphasising the differences between the past and present organization of the space.

The geometry alone cannot give an accurate impression

of the medieval space, so it was necessary to perform a complete photographic survey of all the medieval parts still visible.

With the survey we could give material information to all parts now visible and also to some other parts, for example marbles of the ancient chorus, where it was possible to make an hypothesis. Some parts, like the walls, remain without colour information, but they were absolutely coloured, and in fact some fragments were found. With the agreement of the historical experts we chose a neutral colour for all the parts of unknown material until further information becomes available (Figure 2).

An important aspect is the possibility of a continuous integration of all these models with the historical future studies and can be used as a basis for them.

Figure 2: *Chorus of the Medieval Cathedral*

For the reconstruction of the Town Hall and its Tower, Fabrizio Tonelli based his hypothesis on a unpublished graphic document. His studies were finalized on a part of the square, which was useful for Studio Azzurro's work. Then the reconstructed geometry (Figure 3) was coloured with an hypothesis of how it might have been in the Middle Ages (Figure 4).
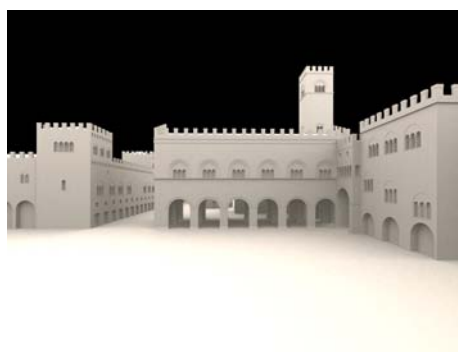

Figure 3: *The Square's geometry, used for civil events*

Both the square and the Cathedral are shown during the

exhibition as a scene-painting for the medieval event of real life, realized by Studio Azzurro.
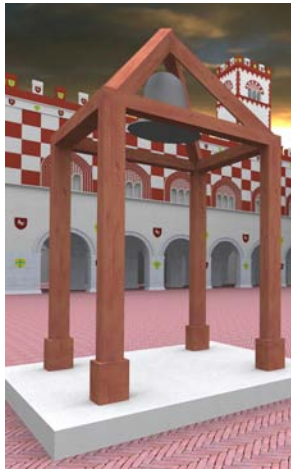

Figure 4: *Coloured palace of the Square*

In fact they based their videos on the position of buildings, for the square, and structure, for the inner Cathedral; at the end they combine our virtual models with the actor's movement in order to represent real medieval life events, both civil and religious. The former use the square reconstruction as scenography, the latter the inner cathedral.

All these models can also be freely navigable and it is possible to create a database of useful information that aids comprehension of all these historical reconstructions.

Finally the medieval kiln was reconstructed under the guidance of Manuela Catarsi Dall'Aglio of Parma's Archeological National Museum.[Cat06]

During the exhibition it is possible to see only an hypothesis of it because the only part found was where the fire was, so there isn't any information on how to reconstruct the cooking room. The visitors can see both the medieval process and the reconstructed structure (Figure 5), which also has reconstructed objects, some parts of which were found during the archaeological excavation.

4. Conclusions

This experience demonstrates that Virtual Reality experts must be able to interact with many different scientific and artistic disciplines. They must also be able to take advantage of computer science tools in order to help people understand and navigate these historical scenarios which have been scientifically reconstructed but are ready to be used as narrative spaces.

Figure 5: *Reconstruction of the kiln in operation*

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