

# Chapter 15

## Enhancing the Cultural Heritage Between Visual Technologies and Virtual Restoration: Case Studies to Models for Visual Communication

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### ABSTRACT

*Enhancement of the cultural heritage is not simply a matter of preserving material objects but comes full circle only when the heritage can be enjoyed and used by the community. This is the rationale behind this paper: the application to exploring projects for the Casa del Fascio (Fascist Party Office) and the building complex of Foro Mussolini in Littoria (now Latina), by the architect Oriolo Frezzotti. Starting with consistent iconographic documentation integrated with bibliographic research and comparison with similar cases, the historical process was retraced and interpreted, reconstructed three-dimensional hypotheses of the figural unity were formulated, and interactive application was created. The application refers to the area of “virtual restoration”, the only possibility for non-material histories and works, a field in which visual technologies can prolong the critical “eye” to which recomposition of the figural combination is entrusted.*

### INTRODUCTION

The objective of the chapter is to present two particular “representation” experiments where visual technologies aimed at simulating the space are interpreted as active devices to construct accessible, participatory, and involving communication of Cultural Heritage. The “3D digital scene” lies at the heart of the applications. It is the “participatory” place *par excellence* to construct information and ac-

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cess cultural content. The “3D digital scene” and more generally the “visual models” activate means of approaching the Cultural Heritage. They centre on emotional involvement, favouring involvement and participation through the experience.

A common denominator of the different applications is therefore the 3D model. It is, however, “diluted” by integration and overlays with different environments. In particular, the applications offer exploration of digital reconstructions of the case studies, testing the following:

- The static spherical panorama: a digital model from which panoramic representations and 360° navigable Virtual Tours are derived, but only from fixed points of view. It is therefore useable in a discrete, discontinuous way.
- The dynamic interactive perspective for real-time navigation of the digital model (Migliari, 2008). This allows for greater interaction with the reconstructed space, which can be explored in a fluid, continuous way.
- The presentation follows and describes the phases of experimentation, for this purpose is organized into four parts.

In the first part, the case studies for which the applications were developed are described in detail, pausing on the historical/critical analysis on which the digital reconstruction of the 3D spaces is based. In fact, the reconstruction hypotheses of the figural unity of the projects were formulated starting with consistent iconographic documentation integrated with specific bibliographic research and comparison with similar cases.

The second part presents the goals of the enhancement and its possible users. The experience proposed is specified along with its levels of use and interaction.

The third and fourth parts describe in detail the main procedural and technical questions that characterized the experimentation. The presentation is organized relative to the objectives of the different phases, with some specific methodological and technical analysis situated in the scientific context of reference.

In particular, the third part describes the procedures used to create the 3D models for applications, that is:

- The metric/geometric construction of the 3D models based on rigorous, point-like information regarding the geometry, form, and measurements,
- The perceptual rendering of the models, from the choice of surface materials to treatment of the 3D models, for a perceptual result that agrees with the historical/critical interpretation,
- Finally, the fourth part describes the main procedural and technical questions that characterized the creation of the applications themselves, that is:
  - The procedure to create the Virtual Tour, with an analysis of the spherical panoramas and virtual tours situated in the context of cartographic and photogrammetry representations
  - The procedure to realize the Real-Time Navigable Model, with various analyses related to questions of discretization and the perceptual rendering of the model in relation to its real-time exploration.

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