Chapter 15

Representation and Elaboration of Architectural Perspectives

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ABSTRACT

In the present contribution, the author presents research on the Winter Room of Palazzo Brignole-Sale (Palazzo Rosso) in Genoa, Italy, which is part of the decorative cycle of the Seasons. The cycle displays the peculiar characteristics of the seventeenth-century Genoese decorative style, where architecture, painting, furniture and stuccos are highly interconnected. The research was carried out using the data collected with nodal-photography techniques. Thanks to these techniques, it was possible to obtain an interactive panoramic spherical photo and high-resolution scaled photos of planar projections of the architectural perspective, in order to identify the real and illusory space. The analysis proceeded with a series of reverse-perspective constructions and the consequent reconstruction (using three-dimensional models) of the possible virtual space represented in the paintings. Thanks to this information, the author was able to carry out the necessary study to understand the peculiar characteristics of the decorations, the optical illusions of which are extremely impressive.

INTRODUCTION

The study of architectural perspective aids the understanding of a particularly interesting cultural aspect of seventeenth-century architecture, in that it focuses with specific attention on the perceptive elements of space, which is intended as an integration of the real space with the illusory space, which was created with decorative techniques. Talented artists of the time, who were specialised in figurative painting, architectural perspective and golden stuccos, were involved in the creation of these complex and artful decorations.

The present research has been carried out within the Research Project of National Interest (P.R.I.N. 2010/11), denominated “Architectural Perspective: digital preservation, content access and analytics” (National Scientific Coordinator: Prof. Riccardo Migliari; Genoa’s Local Unit Scientific Manager: Prof. Maura Boffito).1

DOI: 10.4018/978-1-5225-0680-5.ch015
In order to document these spaces, Genoa’s research team applied a series of techniques based on digital photogrammetry together with the acquisition of topographic information. In one of the utilised methods, a system of photos was used to obtain (thanks to an image-based 3D-modelling software) coloured and georeferenced point clouds as well as orthophotos. Another method involved the use of tools to obtain an interactive panoramic spherical photo and high-resolution photos of planar projections. Additionally, in some cases regarding relief perspective, the national research team applied 3D-laser scanning techniques.

The different survey methods were applied by the research team depending on the geometrical characteristics of the quadratura’s surfaces (flat or curved), the particular subject being studied and the examinations to be performed. The research team examined how these paintings had been realised by studying the literature on the topics represented in the decorations in connection with the figurative, iconographical and architectonical models. With reference to architecture, perspective treatises of the time were taken into account in order to retrieve the geometrical constructions, which were used to realise the painted perspective. As hereafter described, a direct relationship between quadratura and the content of several treatises on architecture was observed too. In order to carry out further research, it was essential to integrate the competences of many different fields: restoration, architectural representation and history of architecture, together with the necessary knowledge of how to use specific digital, photographic and 3D-modelling tools. In certain cases, the national research team also applied augmented reality techniques and techniques for interactive exploration of three-dimensional models.2

The results of these studies clearly showed that even if the quadratura experts were comprehensively knowledgeable on the geometrical principles of perspective construction, they often adjusted geometrical rules in order to obtain a certain spatial effect, which required (to achieve the best result) some parts of the perspective drawing to be modified.

Moreover, even if perspective is the most important tool to create a three-dimensional effect of illusory space, it must be stated that often a significant perceptive result is achieved thanks to optical tricks combined with light effects or three-dimensional elements.

In the following chapter, the author highlights the quadratura characteristics of the Winter Room in Palazzo Rosso, partly contextualising them within the perspective culture of the time and pinpointing the peculiar elements, thanks to the data collected utilising the aforementioned techniques of nodal photography, reverse-perspective constructions and virtual modelling, in order to reconstruct a perceptive system, which aids the understanding of the complex relationship between real and illusory space.

BACKGROUND

Architectural perspectives have appeared in the history of representation since the classical age, if considering, for example, the pseudo perspectives of the Pompeian paintings (De Rosa, 2001; Cardone, 2014; Messina, 2014). These artistic displays began spreading from the fifteenth century after the invention and diffusion of geometric linear perspective by Filippo Brunelleschi, Leon Battista Alberti and Piero della Francesca (Sgrosso, 2001; Camerota, 2014).

The seventeenth century was a significant period because the theory and the applicative possibilities of geometric construction began to be more structured, partly thanks to a progressive scientification of this field. One of the key players in this field was the mathematician and architect Girard Desargues, who laid the foundation for projective geometry, that was to be rediscovered in the nineteenth century.