

# The Physicality of Illusory Space in the Wall Paintings of the Church of Nossa Senhora dos Remédios, Peniche, Portugal

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## Abstract

Portuguese religious architecture represents a cultural heritage of exceptional value, characterized by a complex interaction between architecture, art and spirituality. The Igreja de Nossa Senhora dos Remédios is a significant example of how these elements coexist harmoniously in a single architectural apparatus. It is not just a building of worship, but a complex work of art that reflects the historical and artistic evolution of Portuguese culture. The research sets as its objective the analysis of the pictorial decorations on *azulejos* –that is, the traditional glazed tiles with the usual coloring in different shades of blue, which cover the surfaces of the church–, and aims to investigate how the representation of space and volumes was integrated into the decorative apparatus of the church, to dialogue with the actually built architecture. The purpose of the research is both to document the state of fact and conservation of the *azulejos*, but also to understand what direction was put in place in the composition and realization phase of the scenes of the pictorial cycle.

## Keywords

Digital model, method of perspective, *azulejos*, role of observer, expanded perspective.



The Sanctuary of Igreja de Nossa Senhora dos Remédios, Peniche, Portugal (image by A. Moretto and G. Pattarello).

## Introduction: the perspective method in the church of Nossa Senhora dos Remédios

Where the waters of the Atlantic Ocean lap against the cliffs of the Peniche peninsula, the westernmost limit of Portuguese territory, stands one of the jewels of sacred architecture –the Igreja de Nossa Senhora dos Remédios– declared, on 25 October 1990, a property of public interest by the Portuguese Institute of Cultural Heritage (IPPC).

Although the destination of many pilgrimages that repopulate the peninsula during the summer period, in reality the citizens of the small province do not recognise any great architectural value in the structure. In fact, the geometric and spatial conformation of the building does not show any great formal complexity: planimetrically, the church is developed according to a single-nave layout covered by a simple barrel vault, while from a decorative point of view, the surfaces appear bare and smooth, with no cornices or particular architectural orders [1]. Moreover, unlike what is commonly found in religious buildings, the presence of a few steps at the entrance makes the faithful descend towards the altar instead of ascending [2]. The added value, however, is dictated by the presence of *azulejos* [3] that entirely cover not only the interior vertical surfaces but also the intrados of the vault of the nave of the church and on which the pictorial cycle narrating the significant episodes in the life of the Virgin Mary is outlined (figs. 1, 2).

What the *azulejadores* aimed for with their works was the creation of a fictitious space, proposing an alternative perception to that dictated by real space. The cancellation of physical space through the creation of an illusory one was made possible by rigorously applying the method of perspective, in general, and, specifically, vertical frame perspective [4]. And this is also what happens in the church under study and is the main focus on which the main body of this article will be developed.

The study of the wall perspectives primarily leads to the development of initial considerations regarding the application of the method, while the use of new technologies makes it possible to verify in space, albeit virtual, the hypotheses advanced as well as to visualise, in three dimensions, the setting of the scenes represented through the creation of models that simulate their configurative geometries. But the most interesting thing that emerges from this study is certainly the role that the observer assumes in the narration of the story.

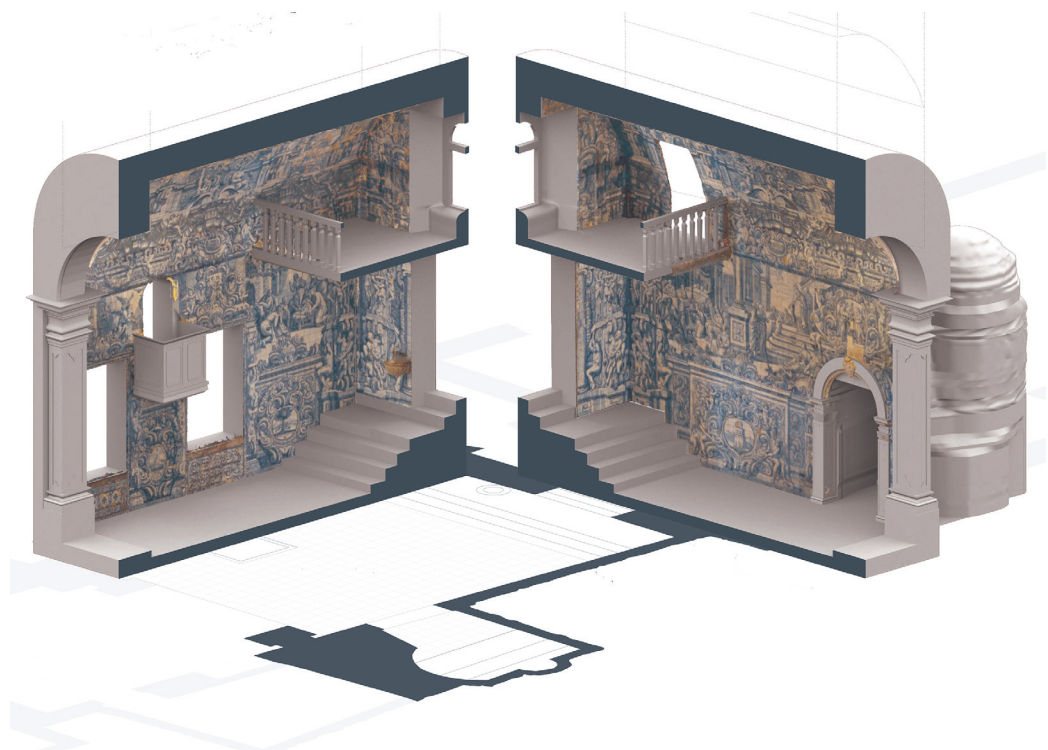


Fig. 1. Digital model with texture of *azulejos* (digital elaboration by A. Moretto and G. Pattarello).



Fig. 2. Parietal cladding development obtained from the photogrammetric survey (image by A. Moretto and G. Pattarello).



The process of perspective restitution makes it possible, starting from an image, not only to restore the planimetric and altimetric data of the objects represented but also to identify the exact location in physical space of the projection centre used by the artists to obtain that particular projection. As we shall ultimately see, therefore, the centres identified are different in terms of the representation of the objects.

### ***Illusory space in the Nativity of the Virgin Mary and the Presentation of the Virgin in the Temple***

The *azulejos* are dedicated, like the church, to Nossa Senhora dos Remédios and depict the most important and significant moments in the life of Mary and her role in the life of Jesus. The representations, in many cases, follow the most common configurations, but in some instances, there are allegories, symbols, and more unusual meanings.

The narrative organization is divided into two registers, beginning in the lower left (when facing the altar) and concluding in the upper right. Everything is enclosed in frames, always painted in vertical perspective on *azulejo*, which, simulating actual architectural structures, provide space for events like windows opening onto different temporal arcs. The same technique is applied to the painted architecture of the vaulted ceiling.

Among these scenes, the largest and most complex ones decorate the left wall, and although they depict two different episodes, they share the same set design.

Like the entire narrative system of the nave, this composition can also be read chronologically from left to right. The first representation shows the *Nativity of the Virgin Mary*, in line with depictions already proposed in painting. Saint Anne, as tradition dictates, is depicted lying on a canopy bed, with a male figure turning his gaze, from the table he is leaning on, to the women taking care of the newborn Virgin. The canopy of the scene rests against the wall of a building with a barrel-vaulted opening that serves as a scenic backdrop. The building's extension in the background continues into the subsequent scene. The distinction between the two is clearly defined by the presence of a column at the centre of the composition.

The *Presentation of the Virgin at the Temple* does not stray from the more common depictions, showing the Virgin Mary climbing the temple's stairs. Behind her, Saint Anne urges Mary to approach the priest, who stands at the top of the stairs, completing the composition with a hint of the sacred building in the background.

The numerous architectural and geometric elements in the frames made it possible to study the perspective drawn by António (c. 1660-1732) and Policarpo de Oliveira Bernardes (1695-1778) [5], revealing small adjustments and scenic solutions that enabled the overall illusion of the composition. To uncover the visual trickery, the process of constructing the perspective was retraced backwards from the perspective drawing.

The first step was the careful observation of the composition, and it almost spontaneously led to identifying the base of the column that divides the two scenes from the life of the Virgin, the *Nativity* and the *Presentation at the Temple*, as the centre of the composition from which to derive the circle of distances. In fact, the fundamental square was derived from the pedestal of the column, which means that the vanishing point of the composition lies on the shoulder of a male figure between the Virgin and the priest, intersected by the horizon line (fig. 3).

Thanks to the study of the theoretical principles of perspective, we can assume that some elements are arranged parallel to the picture maintaining the true shape but not the true size. As a result, adjacent surfaces have their edges converging at the same point, vanishing lines orthogonal to the picture plane, and thus the projection onto the picture of the observer's eye. The ground line was assumed, unlike one would have expected, to be at the lower limit of the representation of the scene, but rather precisely at the intersection of the vertical wall and the floor of the Sanctuary. Since the scene is elevated above the ground line, it is necessary to project the perspective plan of each element onto the geometric plane and then return it in true form.

The structure of the column was irregular, as its elements do not share a single central axis, so it was necessary to adjust the architectural element for a coherent representation. Behind this element, its twin can be seen, but it is not aligned with the first, likely to allow Saint Anne's figure to be positioned near the stairs. Scenic necessity once



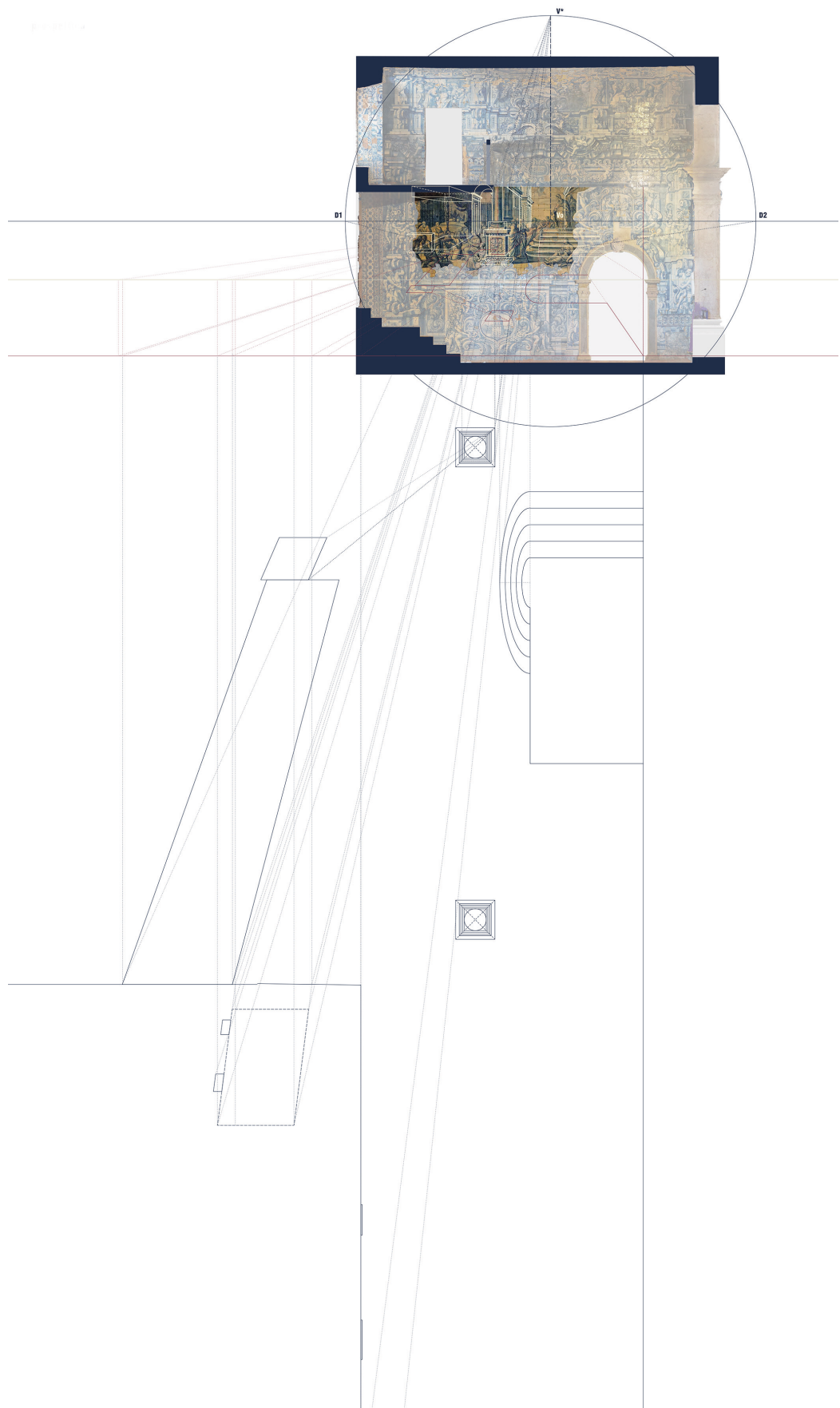


Fig. 3. Perspectival restitution of *Nativity of Virgin Mary and the Presentation of the Virgin at the Temple* (digital elaboration by A. Moretto and G. Pattarello).

again took precedence over architectural accuracy, which was forced in the restitution by repositioning the column correctly.

Once the geometry of this central element was established and its base identified, it became possible to reconstruct most of the scenic elements whose base is known or deducible.

Among these, the temple's staircase presents a clear base but is difficult to reconstruct because the steps are not concentric, as suggested by the wall painting. To solve this, the construction of the steps was developed from those whose tangent point of the curve was known, shaping the subsequent or previous steps depending on their concentricity.

The scene of the *Nativity of Mary* seems not to present any three-dimensional elements with a clear base for floor reconstruction. The only element with a visible base is the table in front of the bed, which, not sharing the same vanishing point as the column but rather the same horizon line, is rotated in relation to it. Therefore, to represent its plan, it was necessary to align one corner of the table's base with the pedestal of the column, allowing its position on the geometric plane to be found. Once its position was determined, the structure of the bed and the arched building behind it could be reconstructed. All these elements, which appear orthogonal in plan, are revealed to be irregular and, having a different vanishing point but on the same horizon line, are rotated relative to the column (fig. 4).

The buildings in the background of the scene do not have a clear base that can be traced, making a coherent representation impossible. Therefore, to reconstruct them, their vanishing point was made to coincide with that of the column. As a result, these buildings appear inconsistent with those in the painting (fig. 5).

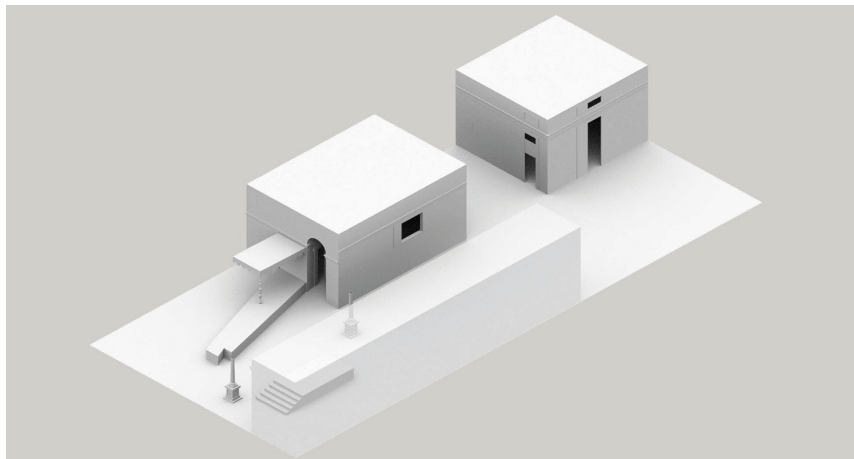


Fig. 4. Digital model of the *Nativity of Virgin Mary* and the *Presentation of the Virgin at the Temple* (digital elaboration by A. Moretto and G. Pattarello).



Fig. 5. Perspectival view of the digital model of *Nativity of Virgin Mary* and the *Presentation of the Virgin at the Temple* (digital elaboration by A. Moretto and G. Pattarello).

### Relationship between fictitious space and actual space in the church of Nossa Senhora dos Remédios

The same procedure of restitution and analysis was also applied in studying the depiction of the *Adoration of the Shepherds* (figs. 6, 7, 8). The scene is placed in the first register of the cycle, directly across from the previously described scene. Its placement, in relation to the *Nativity* and *Presentation at the Temple of the Virgin*, allows for the deduction of some spatial solutions adopted in the three-dimensional space by the Bernardes [6]. In fact, in the analysis of this depiction, the main elements of the construction of fictitious space were found to be mirror images of the representation on the opposite wall.

Like all the representations in the first register, this scene opens on the pedestal of the frame, raised above the common ground line shared by all representations. This means that, for the plan restitution, the base of each element must be lowered to the ground line for accurate representation. As a result, an additional step was required between redrawing the elements in perspective and their restitution in plan.

A second interesting aspect is the positioning of the ground line, which is meant to approach the actual floor level to make the immersive effect of the entire composition as realistic as possible. In fact, it is the intersection between the floor tiles and the raised wall of an *azulejo* tile from the floor.

The last point in common with the previous representation is the horizon line, which, although not at the exact height of the *Nativity* and *Presentation at the Temple of the Virgin*, differs by only three tiles.

These common elements between the two opposing representations in the real space of the nave suggest the study of the construction of fictitious space within the overall three-dimensional dimension of the entire nave, enhancing the visual illusion for the viewer.

Despite these points in common, the axonometric view of the perspective construction of both scenes in three-dimensional space revealed that the viewer of the two scenes is not the same. For the *Presentation at the Temple of the Virgin*, António de Oliveira Bernardes

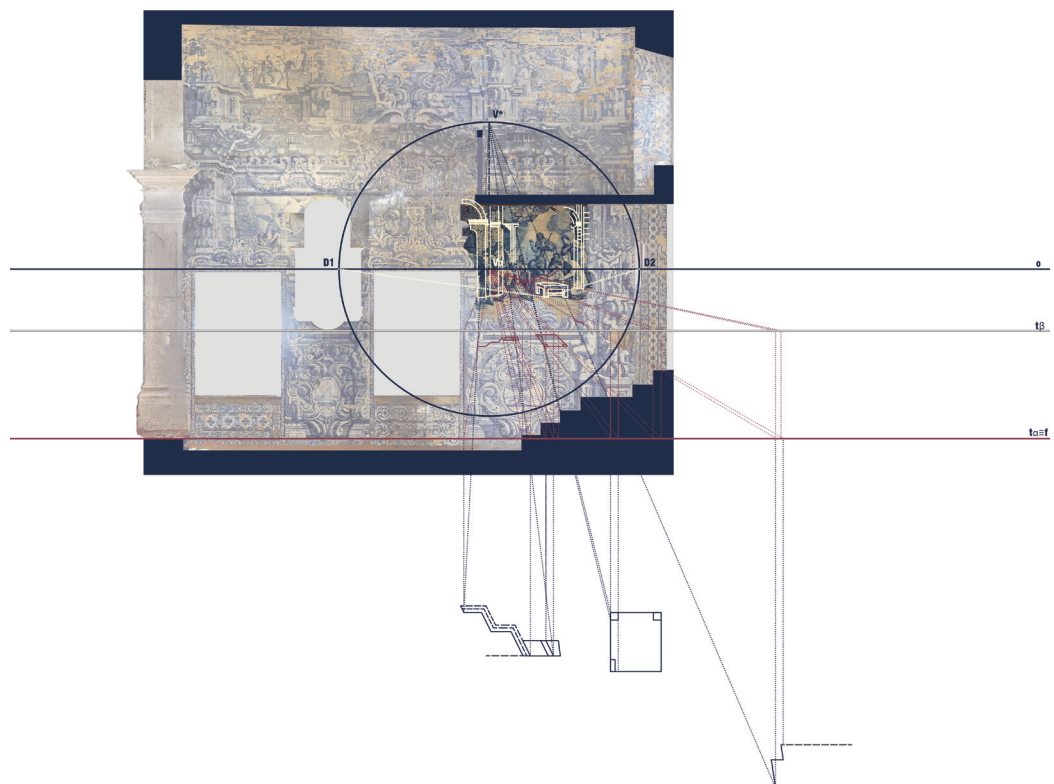


Fig. 6. Perspectival  
restitution of the  
*Adoration of the Shepherds*  
(digital elaboration  
by A. Moretto and G.  
Pattarello).



Fig. 7. Digital model of the *Adoration of the Shepherds* (digital elaboration by A. Moretto and G. Pattarello).

Fig. 8. Perspectival view of the digital model of the *Adoration of the Shepherds* (digital elaboration by A. Moretto and G. Pattarello).

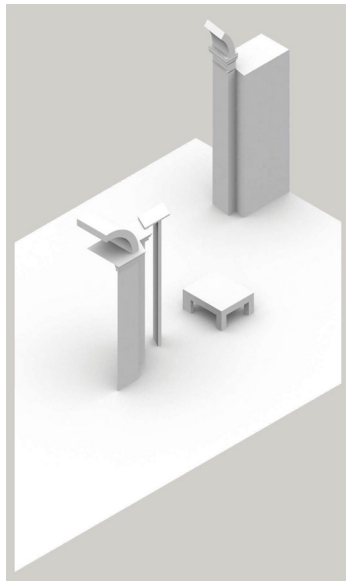
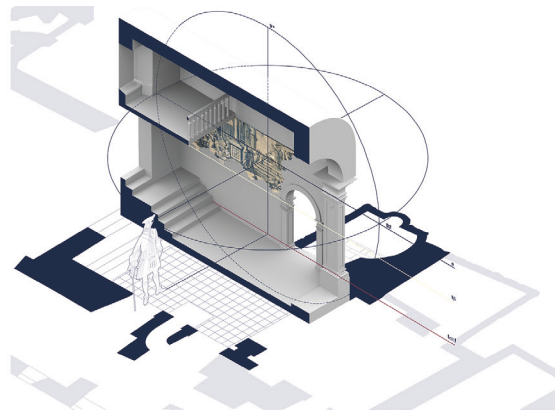
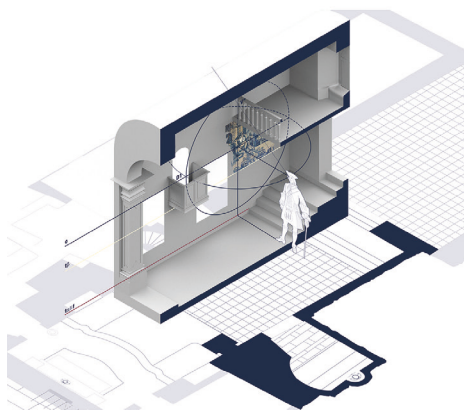


Fig. 9. Axonometrical view of the church with the viewer in his spatial configuration (digital elaboration by A. Moretto and G. Pattarello).



(1686/7-1782) sets the viewpoint adjacent to the wall opposite the painting. Whereas for the *Nativity*, the viewpoint is located on the longitudinal axis of the nave.

These manipulations were necessary due to the limited dimensions of the sanctuary. Indeed, if the rules of perspective had been applied honestly to this space, unrealistic distortions of certain elements would have created a visual break, preventing the viewer from falling into the illusion of fictitious space (fig. 9).

By uncovering the construction of the design by António and Policarpo de Oliveira Bernardes, it becomes clear how the scenic adjustments were made with mastery of perspective drawing.

### Conclusion: the role of the observer on the sanctuary of Nossa Senhora dos Remédios

The conclusion that can be drawn from this in-depth study of the tiled parietal planes (in white and in all shades of blue, almost carbon black), presented above, is a great scientific novelty with major academic implications for the theoretical study of perspective and its origins –as an invention in the representation of the project in Architecture, as well as in the History of Painting. Take the frescoes of Pompeii, where the central vanishing point was already dominant.

Everything that has been said by the theory of art and the theory of architecture about the invention of Perspective is here called into question. Why?

Because in the present case study they expand the internal architectural box, modest in its physical structure and with no apparent style or aesthetics worthy of note in the History of Architecture... However...

How do they expand, making this box... an Architecture of something extraordinary?

They, the *azulejos* painters, expand the architectural box: in the sense that they use the rules of perspective, both in the parietal planes and in the vaults, with the aim of creating, for the user of this space, an enlarged space that goes far beyond the physical space, measurable through measuring instruments from the discipline of physics.

The scientific novelty regarding perspective is that, in this case study, it is not limited to standing in front of the perspective, as in a drawing or in a painting; the perspectives rely on the person walking and crossing the nave until they reach the Altar.

The tile painters relied on the motor skills of those who had come to walk through this internal space, either through the movement of the body while walking through the nave, or through the rotation of their eyeballs (panoramic), for a full experience of a fictional expanded space – as if it were the first step of Cinema (but in the 18th century).

On the contrary, and through its 'perspective design', this particular and very special case of the chapel/church of Nossa Senhora dos Remédios, built in a popular vernacular architectural style and aesthetic, in the 16th century, a mere house: it was later covered with tiles by António de Oliveira Bernardes, Steward of the Brotherhood of S. Lucas, and his son Policarpo de Oliveira Bernardes, who finished it, and signed it.

The brilliance of this remarkable work lies in how the perspectives of Oliveira Bernardes (father and son) are employed in this specific case study. Their approach mirrors the use of perspective on wall surfaces, as seen in the Scuola del Carmine in Padua, where the parietal pictorial decoration began in 1505 and concluded in 1507. This work, originally by Giulio and Domenico Campagnola, was later repainted in 1560 by Stefano dall'Arzere.

Similar cases, for future scientific studies on the 'expanded perspective' or 'expansive perspective' – as I, Pedro António Janeiro, have just called them – can be found in Portugal: Door of the Convent of S. Francisco (Alenquer); Nave and body of the Church of Misericórdia of Viana do Castelo (1719-1721); Main chapel, dome and vault of the nave of the Church of São Lourenço in Almancil (1730); Sacristy of the Convent of Varatojo, Torres Vedras; Frontage and nave of the Hermitage of Porto Salvo, Oeiras (1740); Chapel of the Fort of São Filipe, Setúbal; Tribune of the Chapel of Quinta do Bonjardim, Belas, Sintra; Church of Penha, Braga; Chapel of Our Lady of the Head, Évora.

#### Credits

All the authors shared the principles and the research topics presented in the article. However, the paragraph titled *Introduction: the perspective method in the church of Nossa Senhora dos Remédios* was written by Isabella Friso, the paragraph *Illusory space in the Nativity of the Virgin Mary and the Presentation of the Virgin in the Temple* was written by Angela Moretto, the paragraph *Relationship between fictitious space and actual space in the church of Nossa Senhora dos Remédios* was written by Giovanni Pattarello, while the paragraph *Conclusion: the role of the observer on the sanctuary of Nossa Senhora dos Remédios* was written by Pedro António Janeiro.

## Notes

[1] The earliest known description of this church comes from Frei Agostinho de Santa Maria (1642-1728), who, in 1707, published a ten-volume work titled *Santuário Mariano*, detailing Portuguese artworks and buildings dedicated to the image of the Virgin Mary.

[2] This particular downward slope seems to be due more to the particular orography of the terrain, which slopes down from the square of Largos de Remédios towards the cliffs behind, than to a conscious design choice of the architect.

[3] The word *azulejo* (or '*azulejo*' in the old spelling) has an Arabic origin and has been the subject of etymological controversy. Contrary to what the association with the colour blue suggests. The word *azulejo* probably originated in the ceramic centres of Andalusia, of Muslim origin, and was adopted by the Castilian language. Its assimilation into the Portuguese language probably occurred through imports of Andalusian tiles at the end of the 15th century, appearing in Portuguese documents at the beginning of the following century. Although the origin of *azulejo* is not Portuguese, in no other country on the European continent has this material received such an expressive and original treatment, well adapted to the various specific economic, social and cultural conditions, nor has it been used in such a complex and extensive manner, with purposes that go far beyond a simple decorative role, as in Portugal: Meco 1986, p. 29.

[4] The theoretical foundations of this study were based on Sgrosso 1976, which provided the fundamental elements of the perspectives represented and their subsequent development.

[5] *Azulejador* belonged to the *Ciclo de mestres* i.e. group of tile artists who, in the first quarter of the 18th century, brought *azulejo* workmanship to a remarkable level of quality in both technique and figurative representation: Meco 1985, pp. 44, 45.

[6] Given Antonio and Policarpo's artistic training in oil painting, their works contain the study of perspective, as confirmed by Santo Simões who suggests the presence of Pozzo's and Palladio's texts in Portuguese artists' circles in the first quarter of the 18th century: Simões, Câmara 2010, pp. 47, 48.

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