

EXTENDED ABSTRACT

GEOMATIC ANALYSIS OF THREE BAROQUE ALTARPIECES IN SOUTHEAST SPAIN: THE SINGULARITY OF A RELIGIOUS HERITAGE RESOURCE OF TOURIST INTEREST

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1. INTRODUCTION

Metrical study of Spanish baroque altarpieces, using various methodologies, allows us to reflect on the possibilities of analysis, dissemination and inclusion of these heritage resources, which have important potential for tourism. Most historical altarpieces are subject to some kind of legal protection. Many remain in situ and consequently fulfill the function of protecting the sacred image, adorning the church and providing a scenographic frame, which acquires its full splendour during the liturgy. To be properly understood and enjoyed, altarpieces need to be seen in the setting for which they were designed, and during the service. It is then that their gilded architecture displays its values as tangible and intangible heritage, in an atmosphere that stimulates the senses. The application of new technologies to altarpieces lags behind their use in archaeology, architecture and other arts. Although progress is being made, much remains to be done.

Geomatics has an essential role to play in research on altar pieces, conservation and restoration tasks, tourism planning, teaching at various levels and making works of art accessible to groups with disabilities and people for whom it is difficult to visit them. In another context, the material obtained can be used as an educational resource in video games.

2. OBJECTIVES AND METHODOLOGY

Three baroque altarpieces in different Spanish towns and cities were documented graphically using complementary methods, namely convergent digital photogrammetry and laser scanning measurement, supported by classical topography. The aim was to study the results, compare them and make them available to the public. Three works from the eighteenth century were chosen, located in two churches and a chapel officially designated as Sites of Cultural Interest. All three are preserved in the place for which they were conceived. The works selected were the main altarpieces of San Miguel in Murcia, containing works by the famous sculptor Francisco Salzillo and his father, Santa Catalina in El Bonillo (Albacete) and the chapel of Nuestro Padre Jesús Nazareno in the church of Santo Domingo in Cartagena. The last-mentioned belongs to a historical confraternity and its statues are taken out into the streets in the Holy Week processions, which have been declared of International Tourist Interest.

The virtual modelling was carried out without any physical contact with the altarpieces themselves, avoiding possible damage. The process is explained and each case is analysed. The 3D virtual models have been made available for viewing through the freely accessible Sketchfab platform: the altarpiece of San Miguel de Murcia can be seen at <https://skfb.ly/6tMrU>, that of El Bonillo at <https://n9.cl/hjge9> and that of Cartagena at <https://skfb.ly/6G7Ou>.

3. RESULTS AND DISCUSSION

Each altarpiece is unique and requires a specific approach, although some issues are generically applicable. Metrical data and cross-sections at different heights of the structure are provided for all of them. Since 2017, when we started this project, we have made progress in improving the modelling, as well as in optimizing the mesh. In the case of San Miguel, as an example, metadata has been included, incorporating alphanumeric information. The sculptures located in various positions and at various heights were measured to try to gain a better understanding of how to they managed to avoid detracting from the main sculpture, which was earlier and smaller than the others. In Cartagena, we had the opportunity to move the sculptures and photograph the non-visible part of the architectural structure, hidden behind them. In El Bonillo, we worked on studying the Solomonic columns, their direction of rotation and their decoration. At the same time, specific dissemination activities were conducted.

Technology is not capable of fully investing the exact virtual copy with the performative dimension the object possesses, the multisensory impact it entails and the emotions it arouses. The simulacrum of the object is not the object itself and cannot compete with it, nor with its theatricality. However, the possibilities offered by 3D models are many and important. Moreover, the information they provide is essential in view of the possible risk of disasters and other contingencies. Recently, exact reproductions of masterpieces of painting and sculpture have been installed in their original locations, taking the data from the original works in museums and elsewhere, and consideration has been given to what such reproductions provide and what role they have (Lowe *et al.*, 2020). In addition,

facsimiles are being used as substitutes for the originals in temporary exhibitions, in the interests of preservation. In our case, we programmed an exhibition at the Polytechnic University of Cartagena in 2019 and made a 3D-printed replica of part of an altarpiece and the sculpture it contained. This made it possible for people with visual impairment to enjoy these artworks through touch, and information in Braille was provided. Our intention is to continue pursuing inclusive actions. Gamification activities were also planned for this exhibition. Through an interactive game that allowed visitors to move the sculptures of the altarpiece in the chapel of Nuestro Padre Jesús, we sought to explain the reason for the distribution of the images and their hierarchies.

In the case of altarpieces that have not been preserved, more emphasis should be placed on virtual reconstruction based on old photographs, descriptions and works of similar date. In this way, a virtual reality environment could be articulated, or the digital model of the altarpiece could be made mutable by introducing moving doors in main niches and tabernacles or modifying the lighting and shadows. The virtual 3D model could even include some of the altar vessels and dressings and also sound effects, with voices and liturgical or processional music, as appropriate.

It would be worth georeferencing and adding data on the history, authorship and distinctive features of the work and details such as visiting hours, keeping them updated, so that interested persons and tourist guides could plan their access to the church and viewing of the altarpieces in a satisfactory manner. This would help to increase dissemination and raise awareness of the value and safeguarding of such outstanding heritage assets. A National Altarpiece Plan should be drawn up, as well as a Risk Charter, continuing along the path laid out in the Altarpiece Charter, signed in Cartagena de Indias on 1 March 2002, and in the 2002 Altarpiece Document, signed in Seville.

4. CONCLUSIONS

The use of geomatics applied to baroque altarpieces and analysis of the results allow us to draw the following considerations:

— Baroque altarpieces constitute a culturally significant corpus, traditionally studied in terms of their form and meaning. Photogrammetry and laser scanning are helping to enhance our knowledge of these liturgical fixtures and to make progress in researching, conserving and disseminating them.

— Altarpieces are very difficult objects to measure because of their shape and colour, generally monochrome gilt. New technologies provide faithful images of what they directly record and the program recreates others that remain hidden from the camera or that pose difficulties for data collection. It must be clear what has been modified during the process.

— Three-dimensional models provide precise documentation of this heritage resource in terms of its dimensions, proportions and, in part, its state of preservation. However, the mesh needs to be optimized for dissemination purposes, without this involving a loss of visual quality. The study does not end with obtaining the models. The possibilities for analysis offered by photogrammetric information must be further explored and supplemented with data on construction, materials, techniques and artists, as well as any

interventions the piece has undergone. All this information can be incorporated into the 3D models generated through BIM. A better understanding of the work leads to a more accurate determination of the actions to be taken for its protection. The formation of multidisciplinary teams is essential for making decisions.

— Every altarpieces that is subject to some kind of legal protection should be modelled, starting with those designated as Cultural Heritage Assets and those located in chancels, as prime locations. An action protocol should be established and standardized, and access to the data should be open and free of charge. These works are part of a nation's identity and cultural heritage and we must make full use of the possibilities and challenges offered by ICT to contribute to their appreciation and dissemination and to foster awareness of the importance of safeguarding them, reinforcing the link between cultural objects and the society that enjoys them. However, a virtual image of an altarpieces does not reveal all its values as tangible and intangible heritage, nor the changes in how it is perceived.

— Models created with 3D printers are easily disseminated and enable us to make them more accessible to the visually impaired and to reach other vulnerable groups. Moreover, virtual images can be used in gamification, combining entertainment with learning. There is still much to be done and many challenges to be faced.

— In the past, the production of altarpieces required dialogue between master craftsmen from different professions. This collaboration is an example of action, which will hopefully be continued and sustained in the present and the future.