

# 3D Reconstruction of Cultural Values at the Regional History Museum—Veliko Tarnovo

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**Abstract.** The project paper presents the work done by the Regional History Museum – Veliko Tarnovo (RHM) on 3D reconstruction of cultural values and objects from the Veliko Tarnovo region – the St Peter and St Paul church in Veliko Tarnovo, the chorus of the metropolitan Nativity church in Arbanassi and the St. Dimitar church in Arbanassi.

**Keywords:** 3D Reconstruction, Cultural Artefacts

## 1 Introduction

The application of various kinds of software in carrying out projects for the conservation and restoration of immovable cultural monuments has proven particularly relevant in recent years. This concerns temples whose decoration has largely been preserved, but in time they have been destroyed, lost their murals, had their iconostases and icons belonging to them replaced, or generally had the form of their interior spaces altered. The legacy of Christian monuments in the Bulgarian lands is extremely rich, but many have had their architectural planning changed, lost their frescoes to varying degrees or had their iconostases reformed. Cultural institutions such as museums, archives and galleries preserve enough varied and rich material of photographic documentation, architectural plans and schemes of these churches. The assembly of these materials allows their restoration in a modern way—by creating three-dimensional graphical models and positioning them in space. Before such an activity can be implemented, however, the whole process is assisted by the assembly of accurate data, which play a major role in creating simulative projects through modern virtual technology—so-called 3D (three dimensional space) programs.

## 2 3D Projects of Regional History Museum - Veliko Tarnovo

In 2008, a RHM team together with Dr. Svetoslav Kosev (lecturer at the Faculty of Fine Arts, Department of Graphic Design and Visual Communications at the University of Veliko Turnovo) has started work on the project Virtual reconstruction of architecture and frescoes of the St Peter and St Paul church in Veliko Tarnovo [1]. The result was the development of an avi clip with the possibility of seeing fifteenth-

century frescoes in the narthex, which were practically destroyed in the 1913 earthquake. Part of the computer animation (in the form of illustrations) was presented in the festschrift to Prof. Elka Bakalova [1]. Subsequently the project was completed with the idea of linking the movie clip to the official website of the RHM of Veliko Tarnovo and combined with a short annotation.

At the end of 2009 a new idea came up: make a 3D version of the reconstruction of a beautiful antique seventeenth-century chandelier (chorus), which belonged to the metropolitan Nativity church in Arbanassi. Certain elements of this construction were reused, cut up roughly and used for building a lectern for the same church. This lectern is now exposed as part of the display of icons in the National Revival and the Constituent Assembly Museum in Veliko Tarnovo. Other parts of the chorus are missing. Thanks to the useful study by Professor Ivanka Gergova, the wood-carved fragments were graphically reconstructed in 1996, logically analysed and provided for additional future work [2]. The workmanship of the chorus itself does not differ from the making of late medieval iconostases: 12 plachets are carved, covered with gold leaf and in some places with egg tempera iconography. The plachets depicted the 12 apostles on the outside and 12 prophets on the inside, arranged in circles, attached to each other and lifted by chains. Still, the graphic reconstruction and data from the publication can't give the viewer an overall visual impression of the grandeur and splendour of the chorus, which was the main reason for resorting to modern methods of reconstruction and imitation of the monument in the middle of the existing temple. The idea is to re-photo the preserved elements of the lectern and transfer them to Maya Autodesk 2009, which enables the construction of a more accurate 3D structure. Adding information from Prof. Gergova's research on the iconography of the images and using the capabilities of the program, a complete restoration was attained, which can be viewed from all sides, thus showing the splendour of the gold on the reliefs. The nave of the Nativity church with the accompanying frescoes and the iconostasis were additionally virtually imitated, discreet lighting was launched mimicking the sparkle of candlesticks, and the chorus was set in the same environment. The result is an effectively realistic computer animation placing the spectator's view in the interior of the seventeenth-century church.

In 2011–2012 the model of an architectural restoration of the St. Dimitar church in Arbanassi (which will also be linked to the site of the Veliko Tarnovo Museum) has been completed. Construction details of the aqueduct of Nicopolis ad Istrum are currently being developed with the idea of showing viewers the movement of water and distribution mechanisms.

## References

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