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Graphical Heritage

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Fusion of VR and AR Strategies for Immersion in Lost Historical-Architectural Heritage

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Abstract. The Santa Cruz Monastery in Coimbra, of the Canons Regular of St. Augustine, founded in 1131, was one of Portugal's main religious houses before the religious orders were extinguished in 1834. The acritical use of the building and its subdivision and attribution to various entities during the following years, contributed to the progressive destruction of important artistic and architectural legacies (Dias and Coutinho 2003; Craveiro 2011).

Today the former scale and richness of the monastic complex is difficult, if not impossible, to grasp, in the way that contemporary observers have a drastically changed perception of the original architectonic structure. At the same time, artistic pieces commissioned by the monastery are today scattered over a panoply of museums and other institutions. This was the main reason why we decided to establish a research project combining architecture and history of art with new technologies, more specifically with technologies related to Virtual and Augmented reality. Therefore, we became interested in the integration of these two emergent fields of development that gave rise to what has been designated as Mixed Reality (Milgram and Kishino 1994, pp. 1321–1329). In this way, tridimensional digital recreations of architectural and sculptural components are being produced to enhance the remaining context with photorealistic elements and data from other areas of knowledge, providing visual, acoustic and even tactile immersion.

Keywords: Architectural heritage · Mixed Reality · Santa Cruz Monastery

1 Introduction and Background

During the late 19th and early 20th centuries, important parts of the Santa Cruz monastery, in downtown Coimbra, were destroyed. Among the most significant are the monastic façade, the porter's cloister (replaced by the town hall building, 1876-79), the Renaissance dormitory (128 m long) and a prominent medieval/baroque belfry (Couto 2014).

In order to enable a renewed understanding of the erased past of the Santa Cruz monastery we decided to put up a research project proposal aimed at producing virtual reconstructions of this lost architectural heritage. This proposal was selected for funding in an open call, by FCT, Fundação para a Ciência e a Tecnologia, the Portuguese scientific and technological agency. The project we are currently developing