

## **Cracow University of Technology, Faculty of Architecture**

Doctoral dissertation entitled:

### **VIRTUAL RECONSTRUCTION AND ITS MULTIMEDIA PRESENTATION IN THE PROTECTION OF HISTORICAL SITES**

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The subject of this thesis is an attempt to answer the question whether virtual reconstruction and its multimedia presentation can constitute a valuable alternative in the methodology of historical monuments' preservation and an important way for catering to the public's right of access to cultural heritage and education about it. The author examined whether and in what cases digital reconstruction, presented using the latest technologies, can become an alternative to the physical reconstruction of architectural sites, and whether it is possible to scientifically document and exhibit historical sites by means of available tools.

The theoretical part outlines the historical background, theory and doctrines pertaining to both physical and virtual reconstruction, spanning from the beginnings of modern historic preservation to the present day. The means and methods of performing digital reconstruction were also analyzed, focusing on selected examples. The paper scrutinizes digital tools and multimedia presentation methods: virtual museums, digital holography, 3D mapping, augmented reality (AR) and virtual reality (VR). These technologies are discussed with reference to domestic and foreign examples, and due to the nature of the topic, the time range was limited from the late 20th century to 2020 inclusive. The example of the Blessed Virgin Mary Church in the High Castle in Malbork was selected to assess the further implementation potential. The author provides the historical background of the construction of the church and castle, its history, phases of construction and transformation, alongside the history of preservation from the 19th century to 2016.

The academic community is split over decisions to pursue physical reconstruction of historical buildings. The history and development of preservation doctrines such as the Venice Charter, the Nara Document on Authenticity, the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage, the Cracow Charter 2000 and other regulations provide the starting point for a discussion on the grounds, reasons and motivations for undertaking physical reconstruction of historical buildings. In the context of the literature research and case studies carried out in the paper, it was found that in certain circumstances virtual reconstruction may be a **viable** alternative to the physical reconstruction of architectural sites, especially interiors, details and painted decorations, which constitute their integrity. However, digital reconstruction is primarily an important research and documentation method in the field of historical monument preservation, whereas its multimedia presentation with the use of virtual museums, 3D mapping, VR and AR environments and digital holography may be considered a fully-fledged method of sharing and displaying architectural and archaeological monuments.

Cracow, April 28, 2021