

Virtual Reality for Cultural Heritage Applications

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Introduction

Virtual Reality (VR) technology is an important education tool that can assist researchers in the conservation, preservation, and development of cultural heritage sites thus opening up new possibilities for cultural heritage.

Cultural heritage objects and environments as well as architectural masterpieces that have been destroyed or deteriorated over time can be reconstructed and presented as three-dimensional virtual representations.

The objective of this project is to develop and realize a concept for a Virtual Reality interface for the presentation of complex heritage structures.

Project Development

To reconstruct these structures, we will first select and create an immersive 3-D environment of a Singaporean cultural heritage model, generate a virtual scenario and realize techniques for navigation and interaction within this virtual environment. Novel modeling techniques will be introduced to provide for a realistic virtual environment and to present the cultural objects in their historical context.

With the immersive virtual environment serving as a base, intuitive interaction techniques will also be integrated to enhance the human-computer interaction. Virtual agents that can assist in the teaching of historical heritage context will be introduced into this virtual environment through the use of interactive real-time media and VR technology. These virtual agents will be driven by the visitor's needs with an emphasis on the visitor's interest in specific cultural objects or contents. The visitor's role should be an active one since the system is e.g. able to visualize additional individual information of interest. Lastly, the presentation of the heritage model will be of high quality enabling real time visualization and should be suitable for large-screen projection allowing the visitor an immersive experience of this virtual world.

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German Abstract

Virtual Reality Technologien eröffnen neue Möglichkeiten, um kulturelles Erbe zu erhalten. Architektonische Meisterwerke, seien sie noch vorhanden oder aber längst zerstört, können als digitale, dreidimensionale Modelle nachgebaut werden. Neue Technologien erlauben es, virtuelle Repräsentationen zu betreten und zu erforschen und machen die Geschichte lebendig. Ziel dieser Arbeit ist die Entwicklung einer neuen Virtual Reality Umgebung, die die Darstellung von komplexen Modellen in Echtzeit und in einer hohen Qualität erlaubt. Einen Schwerpunkt bilden dabei neue und intuitive Interaktionstechniken, die den Besucher und sein Interesse in den Mittelpunkt stellen.



Figure 1: Chinese temple in Singapore