



ROYAL UNIVERSITY OF PHNOM PENH

Master of Science in Information
Technology Engineering

Multimedia Science

COMPUTATIONAL SCIENCE FOR CULTURAL HERITAGE

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Field related: Computer Vision, Computer Graphics, Historic Architecture, Archeology

Abstract

When working on projects of scientific computing where the application area is a building or an assembly of buildings (such as a temple), one of the first tasks that we encounter is the geometric modeling of the architecture. While the techniques to establish such a geometric model are not new however, special circumstances have to be kept in mind when dealing with ancient architecture instead of modern buildings.

Geometric modeling of vast building complexes is a tedious and difficult task. In contrast to the a priori work of an architect who constructs modern constructions, the computer reconstruction of ancient buildings faces a serious problem: The computer model copies the real world - not vice versa. This leads to the question of model abstraction in particular for quantitative visualization. While the real world building features a vast amount of detail, the model has to reduce these details to a point where a computer model is small enough to be manageable by current hard- and software.

In contrast to geometric modeling, virtual reconstruction for preservation and conservation work of historic architecture and artifacts requires extreme high precision data . Three dimensional scanning technologies are therefore the best solution. Although this technology could immensely facilitate the site work still a lot of technical problems have to be solved which is an excellent chance for research projects. Computer science and computational methodologies are nowadays almost indispensable to support in the field of conservation, preservation and archaeology.

In this context, the Interdisciplinary Center for Scientific Computing (IWR), University of Heidelberg, Germany, in close collaboration with the Royal University of Phnom Penh, provided in the framework of its "Angkor Project Group" scholarships of *Innovation Award in Scientific Computing for Cultural Heritage* to outstanding and motivated students to do their local researches.

References:

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