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# Computer Graphics and The Topkapı Palace

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This paper summarises a multivision presentation of the research on with visualization of Topkapı Palace.

## Visualising a historical image

Since beginning, human being is always interested how important events and image of the past can be simulated. This natural feeling caused the art over many centuries to work for religious impression. Since Ancient Egypt, the number of artists has tried to visualise several mystic characters such as goddess, kings and heroes.

In the history of art, Noah's Ark which was recreated by many artists is the first important reconstructed image. The Ark which was mentioned and described by monotheistic religions and mythologies was illustrated mainly in three different ways: a coffin-shaped box in early Christian painting, a floating house in medieval art and a kind of boat in the Renaissance but there is no certain image definition. The works may support the sensibility of the artist about this subject.

Whatever the reason is, a number of similar mystic buildings which is no longer exist has also been redesigned since Noah's Ark. These artistic works are also a factor which developed the religious ideology and public movement in the society.

## Reconstructing by computer graphics:

Contemporary architectural and artistic sense carries out the ability of reconstructing the past in rather more realistic way paralleled with technological development and modern representations.

In the modern meaning, architectural reconstructions have improved to be able to realise the previous culture in comparison with past and present as visualising the historical miles. Taking the advantages of high level computer graphics, the capacity of mass

storage and hardware speed, a number of important historical building which is no longer exist can be possibly reconstructed.

Especially, British Scientific Centuries are doing some important research in this area. The researcher from IBM Scientific Centre succeeded to create a number of archaeological reconstruction by their powerful photogrammetric techniques and software. Their last example, the Pompeii Project is one of the most interesting work up to now. On the other hand, Strathclyde University, ABACUS centre has been working on the Historical Edinburgh Project. Computer Graphic Reconstructions are also able to visualise the transition and historical development of the building. The Medieval Genoa Project presents the historical transition through the centuries by very impressive computer graphics. Patricia Alkovan's the Houston City Project is the most recent work in this area.

### **Visualising The Topkapı Palace:**

Considered with historical heritage which was remained from several civilisations that used to be in Anatolia, there are many historical buildings to be able to visualise for computer graphic reconstruction. It is no doubt that, the Topkapı Palace which was dramatised for films, novel and operas are the first remarkable example to work on.

I am doing a research about the Topkapı Palace for a year. This project is sponsored by Apple-Bilkom, British Council and Strathclyde University in the collaboration with Mimar Sinan University.

The Palace Complex has been changed several times and The Sarayburnu where The Palace is settled has been lost the originality during centuries. The records are limited and there are not very much research about the Palace. In this project, I referred the computer reconstruction to Sedat Hakkı Eldem's book called The Topkapı Palace. The palace complex is concerned with analyses on the fourth courtyard depending on the geometry, texture, colour and animation. Computer experimentation was realised using Macintosh hardware and Architiron II 5.51.

The Topkapı Palace Project is the most sophisticated research in the applications of computer graphic reconstruction. Domes, arches, columns, and similar modular instruments from the Palace give an opportunity to examine each possible geometrical

form in the potential of computer graphics. In the contrast of the buildings which were studied by the similar research, the drawings of the plan can only be mapped into the computer environment. Domes, roofs which were constructed with the extension of skylights, facades which are surrounded with arcades had to be enhanced on the plan by mouse manipulated drawings. As opposed to the general idea, this modelling technique becomes a reason time-consuming. Reconstruction of all buildings that were changed, rebuilt, demolished or fired in 500 years were solely able to be completed by one person in 9 months.

The computer model of the fourth courtyard clarifies the capacity of current hardware and software technology. To allocate small amount of memory, Solid and void coincidence were simulated ignoring ornamentation and detail. Flat-shading technique was chosen to have a faster rendering. The speed becomes a significant problem when animating the model which was created by Macintosh hardware and software, at the visual analyse laboratory of Strathclyde University. One minute animation of the fourth courtyard can be completed in 18 hours by IRIS Computer of Silicon Graphic.

### **Conclusion:**

A real time animation of The Topkapı Palace is not necessary to complete by current hardware and software capacity. Yet, this desire will be achieved by cheaper and more practical techniques in near future because the demand of high capacity of mass storage and faster hardware is increasing.

The Topkapı Palace Project has still been developing. The kiosk and pavilions are visualising one by one rather than complete model. Currently, a hypermedia system is being developed to provide a visual analyse environment for architectural reconstruction studies.

Presenting the Topkapı Palace by computer graphics could be an import project in international platform when it comes to the end. At the moment, the research does not aim to complete the Palace Complex. This regard could not be true and could not be realised by personal effort although some technical supports are being provided.

In any case, The historical development of the Topkapı Palace is not totally a dream. Participation of foundation, national research centre and trusts may certainly be useful to help to complete this project.