

The function of virtual models in education and research as well as in the popularization of architectural heritage as exemplified by historic buildings in Lodz.

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This paper sets out to demonstrate sample virtual models of historic buildings in Lodz which were generated in the Institute of Architecture and Urban Planning at the Technical University of Łódź, to present some foreign examples as well as to discuss their possible applications. The presentation of historic buildings as computer models can be put to good use in popular-science multimedia presentations accessible to a wide audience. Current accessibility of digital studies, the presentation of architectural structures as 3D models offers a perfect means to complement our cultural knowledge/awareness.

Keywords: virtual, models, historical, multimedia, internet

Creation of computer models.

Introduction

Creation of computer models of historic objects and urban groups is not a recent issue. A large number of scientific centres in Poland and in the world work upon this problem. In my opinion the most interesting results are: works over restoring non-existing buildings on base of archival materials (<http://cfml.iit.nrc.ca/3DVirtualBuildings/ProjDesc/TofC.html>: Canada's Digital Collections); adapting a unit generating movement from the RPG game for architectonic and urban employment (http://news.bbc.co.uk/hi/english/education/newsid_982000/982346.stm: Cambridge University); presentation of the city as well as phenomena concerning it including fog (<http://oldcda.design.ucla.edu/caad/worlds.html>: Department of Design | Media Arts UCLA Los Angeles), virtual guidebooks and economic appli-

cations of models as interface for artificial intelligence, entertainment, analyses and games (<http://www.planet9.com/indexie.htm>).

Creation.

My purpose is approximation of operations I have carried out with students of Institute of Architecture and Urban Planning at the Technical University of Lodz while supervising the creation of historic models on example of modelling the old buildings of Lodz.

A good example of the above would be elaboration of Izrael Poznanski's factory plant of cotton industry "Poltex" by architect Hilary Majewski which emerged in the 70s of the XIX century. It is a group of buildings very typical for the city architecture and very timely due to planned transformation of its current function.

Modelling of historic buildings has a valuable function of educating students who familiarise



Figure 1. Gateway of factory plant-model.



Figure 2. Lateral view.

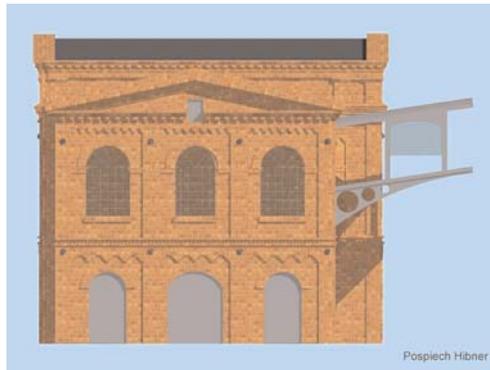


Figure 3. Detail facade of factory plant.

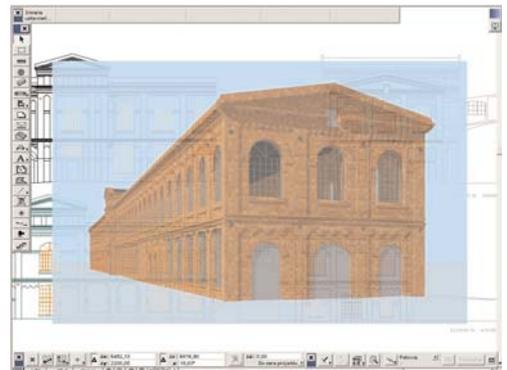


Figure 4. Stock-taking and three-dimensional model

with their beauty while constructing objects and visualising them.

The basic material for constructing models was computer stock-taking obtained from project company. The drawings made in AutoCAD described very precisely architecture as stock-taking was very coherent. Flat modelling of the buildings despite their accuracy do not enable to an average recipient picturing a model in his or her imagination. That is why constructing lump seemed to a be a natural step. Created models are not an exact imitation of stock-taking. Few elements different from the designed prototype have been excluded. These are: outhouses, little roofs, technological cut-throughs, bricking up

some openings. Parts of objects from the 50s of the XX century and later were also excluded. The models reflect the original character of the XIX century industry plant's buildings.

During work simplification of details as well as uniformity of repeatable elements despite their insignificant dissimilarity turned out to be necessary. Such necessity occurred due to limited capabilities of computers 128 MB Celeron 330MHz and to intention of generating of model for requirements of Internet presentation. In spite of that, created objects should assure complete knowledge about form and detail and should be enough for popularly-scientific employment. An ArchiCAD 6.5 program has been applied which

turned out to be a very efficient instrument.

A possibility of showing the building in its original form, not destroyed over the years by exploitation and devastation seems to be a valuable issue. Despite historic attraction old factory buildings are not always well presented on photographic documentation and in nature. "Poltex" seems to be well maintained when it comes to its external form and urban match.

During work we were not focussed on details due to their simplicity, technological character and repeatability on all buildings. There was no possibility of research over entire modelling of detail in the form of three-dimensional scans or processed photogrammetry.

Presentation and popularization

Tools.

The final purpose was popularisation of Lodz architecture as well as its utilisation in the process of scientific research. I have assumed that Internet will turn out once again to be the best medium. However the transferred content must be universal if one intends to reach wide range of recipients. The success of Internet is measured by popularity counted as the number of "visits".

The search for method of presentation of models I have concentrated on Internet technique Intel-Internet 3D Graphics Software but transferred to public use by Macromedia company as Shockwave 3D technology. The goals for the new method were assigned for presentation of commodity of the Internet shop. It should let people see realistic model of product from each side as well as its construction project guidelines and manner of use.

Processing received models on Internet format consists of exporting them for Director Shockwave Studio program and enforcement of reaction. The ultimate result is the movable with capability of enrichment the picture with molecular and illuminating effects (fog, shadows thrown,

textures, "wash aways") and we can expect that all of the methods applied by game producers will be used and made in best possible manner in terms of modern graphic card. Shockwave technology gained the support of a number of companies dealing with creating applications for: modeling, animations, visualisation such as 3D Studio Max-Discret Logic, Maya-AliasWavefront, Amapi-Eovia, True Space – Caligari, LightWave-New Tec, Softimage.

Created models can be enriched by showing design match and adjustment of form with reference to next phases of emerging, animation and pictures of the current state and referring to archival materials.

Current format VRML despite bigger and bigger preciseness and flexibility by adding Java scripts and patterns still requires specialist instruments for viewing models. These problems do not exist at Shockwave which can be easily installed and it is a standard for Internet Explorer 6.0 And Windows XP.

While searching for a tool for model presentation in Internet I have come across a new format Adobe Atmosphere – its capabilities remind of a RPG (Role Playing Game) full of possibilities of movement and sound. That unusual form of data presentation can be interesting for many Internet users since it is a chance for combining education and fun.

Presentation historic buildings of Lodz.

Historic buildings of Lodz have not been entirely presented in Internet with the exception of single, non synchronised initiatives not including the whole region. Creation of database with the capacity of transforming all available material to a wider range of recipients based on Internet would be a good solution.

Presentation of historic objects as 3D models made in Shockwave technology is probably the most interesting way of conducting the first contact with the user. For the recipients with scientifi-

ic background that database formula should offer various levels of access to particular data such as information about object, its authors and technical data. Database should also contain scanned archival materials, old photographs and current condition as well as description and presentation of urban project and its transformation to the today's state.

Imagination

The exceptionality of the computer as a tool for 3D modelling also rests in the fact that it allows to compose forms and worlds that exist only in their creator's imagination. The works submitted for competitions organised by the Graphisoft company could serve as a good example. Participants of these competitions were asked to provide models of such structures as the monastery depicted in Eco's novel *The Name of the Rose* or the Hanging Gardens of Babylon.

Virtual archaeology and stock-taking.

Solutions based on relationship of imagination and research results are being known as virtual archaeology (<http://www.taosnet.com/-architectVRe/html/VRArchaeology.html>). It consists of restoring object's appearance maintained as plots of foundations

And archives using a small amount of information. It is another formula realized in the world for saving and restoring the culture. Emerging presentations are very spectacular and they can excellently illustrate the appearance and the transformation of the buildings and their characteristic features.

Virtual models can be a form of stock-taking of objects exposed to transformations and destruction. That is why they are a method of maintain the heritage in such way that restoring it based on rags of information will not be necessary. Good material for such elaboration are chapels in the Lagiewniki Forest, Ksiezy Mlyn and tombs on the Jewish Cemetery which certainly

undergo a disruption, but the virtual record can be priceless for their restoring or maintenance. I believe that the models of "Poltex" plant can be not only an important element for popularisation of Lodz architecture but also for the maintaining the heritage exposed to changes.

Summary.

Virtual reality stops being interesting detail for popularly-scientific purposes. The computer revolution has caused the turning point making it possible to receive forms and interact while exploring three-dimensional content. Availability of the new method should be all the global community. It would be soon become a new medium for getting knowledge and information.

References

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