



The UMR CNRS/MCC 694 MAP organises a workshop supported by CNRS on the theme :

Scientific Visualisation Issues
in the field of the Architectural heritage:
*Can architectural objects be used as
semantic 3D Interfaces?*

Programme

PURPOSE

The workshop will address issues raised by researchers from both *computer science* and *architectural heritage* disciplines working on the use of 3D representations of edifices as a *media*. This workshop acts as a forum for researchers and practitioners interested in connecting the fields of architecture (with a particular focus on conservation and documentation problems) and computer science (with a particular focus on applications of web technologies)

We expect it to be an opportunity to present and observe experiences and results, as well as to stress needs and lacks of existing methodologies and/or technological solutions. The workshop is also expected initiate the FACE net web tools that are aimed at supporting easier exchanges of information between people interested in the workshop's interdisciplinary theme.

THEME & SCOPE

Numerous researches conducted at the intersection of our disciplines have proved that using 3D models as interfaces to information on the built heritage is a relevant objective. But they have also stressed lacks or limitations of information handling methodologies and technological answers available today. With the development of Web architectures in 3D modelling, it can be extremely fruitful for people involved in the studying of architecture to exchange ideas and experiences on new technological solutions. Where in the field of linguistics, hypertexts are seen as communication, 3D architectural objects can play the same role for edifices. Understanding the formal language of architecture, and finding a relevant representation for it, i.e avatars in a virtual environment, appears here as a vital step.

In writing relevant hypertexts, the question of establishing clear relationships between sources and destinations has been acknowledged as a vital one, and the same issue is raised when trying to attach 3D architectural shapes to information. But taking a closer look on what existing computer tools and formalisms offer when dealing with the architectural heritage shows that their relevance on this particular application field may not be optimal. E-databases and XML technologies are applied in building or site management and their documentation. In parallel, geometric modelling tools, along with photo-modelling platforms, allow the construction of 3D models in which simulations of a morphology is possible. Moreover, GIS systems have proven useful in numerous site management experiences, particularly in the field of archaeology. But whether *there is a way in between* those families of technologies remains to be fully examined.

To put it more simply, can 3D models be efficient in data visualisation or retrieval? Can they offer semantic views on the data collection that are absent from other media? Can they synthetically localise pieces of information with regards to a position in space and a moment in history

Documentation analysis and organisation are vital to the researcher when trying to understand the evolution of patrimonial edifices and sites. Documentary sources are undoubtedly the only scientific basis from which various virtual renderings can be derived and justified. The workshop will be centred on needs and means for the visualisation of the architectural heritage's documentation.

Topics we would like to cover include (but are not limited to) :

- Data collections
 - access policies
 - data analysis and/or visualisation methodologies,
 - digitalisation,
 - interfaces (3D/2D/Textual, ...)
- 3D modelling
 - Solutions on the Web,
 - links between geometrical and qualitative information,
 - support for the notion of Architectural scale,
 - interpretative modelling vs realism.
- Architectural modelling
 - Concept analysis
 - theoretical models,
 - existing libraries,
 - geometry vs architecture,
 - architectural objects vs architectural documentation, ...)
- Heritage-specific problems
 - Uncertainty handling,
 - Conservation documentation,
 - analogical reasoning.

The workshop will consist of short presentations proposed by participants and by thematic sessions during which the above-mentioned questions will be addressed both by critically examining existing experiences and by isolating fields of research to investigate. More detail can be found in the pre-programme.

SPONSORING

The workshop is organised in the framework of two research programmes: PICS n°1150 (CNRS/KBN) and APN (SHS CNRS). It is aimed at the extension of an existing co-operation, called ARKIW, between the UMR CNRS/MCC 694 MAP (Marseilles, France) and the HAIKZ Institute WA PK (Kraków, Poland).

INVITED PARTICIPANTS

Patricia ALKHOVEN, PhD Art and Architectural History (The Netherlands).

Samir ALQEISI, Architect (Iraq).

Farid AMEZIANE, Architect, PhD Computer science (France).

Pascal BENISTANT, Computer Systems engineer (France).

Michel BERTHELOT, Architect, MCC Researcher (France).

Jean-Yves BLAISE, Architect, PhD Computer science (France).

Francesca DE DOMENICO, Architect (Italy).

Livio DE LUCA, Architect (Italy).

Iwona DUDEK, Architect, PhD Technical Science, specialisation History of Architecture (France).

Michel FLORENZANO, Architect, Director of research in CNRS, Head of UMR MAP (France).

Waldemar KOMOROWSKI, Historian of Art, Curator National Museum in Kraków (Poland).

Magdalena GORAS, Architect, Historian of Art (Poland).

Paweł OZIMEK, Architect (Poland).

Zbigniew WIKŁACZ, Architect, PhD Technical Science, specialisation History of Architecture (Poland).

LOCATION

The workshop is organised in the facilities of the UMR CNRS/MCC 694 MAP in Marseilles, France.

Address : UMR CNRS/MCC 694 MAP

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Workshop information on the web:

<http://arkiw.gamsau.archi.fr> (choose the stairs...)

or <http://arkiw.gamsau.archi.fr/enter/faceNet/>

Workshop information will be regularly updated there.

PROCEEDINGS

Although the workshop is intended to be a forum enhancing exchanges more than gathering papers, the materials submitted by the participants and that they wish to publish (papers, 3D models, Web productions, demos, etc..) will be edited on CR-Roms.

Participants are invited to send until April 14th the following possible material:

- Article(s) in PDF or DOC format that they consider relevant with regards to the workshop's themes,
- Web-compatible graphical materials, demos or URL resources,
- PDF or PPT A4 sheets briefly showing methodological or technical answers experienced in relation with the four afternoon session themes as exposed hereafter.

Please send material as attachment to:

idu@gamsau.map.archi.fr

or via FTP: ftp.gamsau.archi.fr

user ftpguest

password ad2604

WORKSHOP PROGRAMME

The workshop's main aim is to bring together people dealing with common methodological problems, even though their actual researches may differ: it is noticeable that from fields as distinct as archaeology, GIS, architectural reconstruction (...) numerous common questions are addressed such as support for semantic 3D models, database interfacing, spatial and temporal data sets, etc.. The workshop's aim is therefore also to let participants acquire a good perception of alternative solutions by critically examining existing experiences and by isolating fields of research to investigate.

The workshop will consist of a morning session during which invited speakers and participants will introduce their research areas and interests, and of an afternoon session dedicated to thematic open discussions. We propose a series of themes and questions we would like to raise during the afternoon session, but additional ones may be a part of the morning session's results.

The sessions will be held in English .

Friday, April 25th

Morning Session

The morning's interventions focus put on getting a global vision of each participant's expertise, each intervention should last 20 minutes.

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| 9h30-9h45 | Welcome address. <i>M.Florenzano, UMR CNRS/MCC 694 MAP director</i> Workshop programme presentation. <i>I.Dudek & J.Y Blaise, workshop organisers.</i> |
| 9h45-10h45 | Invited speakers : presentation of research areas and interests. <i>P.Alkhoven</i> <i>W.Komorowski</i> <i>M.Goras</i> |
| 10h45-11h15 | Coffee break |
| 11h15-12h15 | Invited speakers : presentation of research areas and interests (continued) <i>P. Ozimek</i> <i>Z. Wikłacz</i> <i>F.Ameziane</i> |
| 12h15-12h30 | Identification of additional themes and questions raised during the morning session |

Lunch break

12h30-14h15

Lunch will be organised in the vicinity.

Afternoon Session

Four themes have been selected for the afternoon presentations and discussions. Participants are invited to briefly describe their expertise with regards to narrow methodological or technical questions (possibly through an A4 projected sheet).

These very short presentations centred on practical methodological or technological experiences should result in a possibility for the audience to acquire a global, comparative vision of existing solutions. Each theme will be an opportunity to also open a discussion in order to evaluate the capacities of existing solutions, needs and requirements, and to raise further questions.

Each theme will be introduced by contributions that will illustrate a practical experience and serve as a framework for a discussion we wish as open as possible.

We propose a discussion on the following issues:

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| <p>14h15-15h00</p> | <p>Theme 1 : Database issues : content representation, analysis and access policies.</p> <p>Documentation plays an important role in the studying of an edifice's evolution through time. Depending on the purpose, it is analysed and organised in various ways. It is therefore important to get a global vision of how this documentation is dealt with today, and consequently what is needed in order to exploit or visualise it inside 2D representations or 3D scenes.</p> <ul style="list-style-type: none"> – How can graphical material be structured? (experiences, possibilities, needs) – Do explicit relations exist between the documentation / bibliographical material and edifices or 3D shapes? – Should data sets be structured with regards to access and ownership policies? <p>Introduction by <i>I.Dudek</i>, on the ARKIW project experience: <i>"Exploiting the architectural heritage's documentation: methodology and tools for data analysis and visualisation"</i>.</p> |
| <p>15h00-15h45</p> | <p>Theme 2 : 2D / 3D modelling platforms : constraints and capacities.</p> <p>Geometrical modelling platforms have proven their efficiency in coping with general 3D visualisation problems. But their relevance with regards to heritage and documentation visualisation problems remains to be clearly evaluated. Three aspects appear widely under discussion :</p> <ul style="list-style-type: none"> – How can links between 3D shapes and databases be implemented? – How can the notion of architectural scale be implemented, or be simulated? – What are the actual existing web-based solutions for displaying 3D scenes inside Internet navigators? <p>Introduction by <i>L.De Luca</i>, on experiences and achievements with photo-modelling.</p> |
| <p>15h45-16h15</p> | <p>Coffee break</p> |
| <p>16h15-17h00</p> | <p>Theme 3 : Architectural modelling : what are the objects or concepts to which qualitative information should be attached?</p> <p>Documentation provides clues and indications about the edifice and its shape. Geometric modelling provides a tool for spatial simulation of the edifice. But there is clearly a gap to fill in between these two aspects. This gap can be filled by the analysis of the edifice itself, seen as <i>the object that both documentation and geometric modelling inform</i>. Consequently, a semantic analysis of the edifice appears as an unavoidable step to take.</p> <ul style="list-style-type: none"> – How is the edifice analysed, with which approaches or methodologies? – What types of scientific analyses can be exploited in a 2D/3D visualisation? – Do such possibilities as parametric modelling bridge the gap? <p>Introduction by <i>J.Y.Blaise</i>, on the ARKIW & APN projects experiences: <i>" Using the semantics of architectural objects for XML/VRML exploitation of heritage documentation"</i>.</p> |

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| 17h00-17h45 | <p>Theme 4 : Domain-specific constraints : the field of the architectural heritage.</p> <p>Dealing with historical edifices or sites raises problems that computers are not the best at solving : uncertainty, imprecision, partial data sets, alternative hypothesis, etc...Addressing those questions can be a fruitful contribution from the field of the architectural heritage, starting with possibly three aspects :</p> <ul style="list-style-type: none"> – Should shape uncertainty be scaled and graphically represented? – Should documentation imprecision be visualised? – How can one implement partial /alternative representations of 3D objects? <p>Introduction by <i>I.Dudek & J.Y.Blaise</i>, on the ARKIW & APN projects experiences: <i>“From concept modelling to scene interpretation disposals: raising the issue of shape uncertainty in the field of the architectural heritage”.</i></p> |
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| 17h45-18h00 | Workshop conclusion address. |
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Saturday, April 26th

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| Morning |
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In this additional session discussions may be continued if necessary. Moreover, optional demos are due to take place, during which actual results can be further discussed. Any participant willing to present a demo is welcomed to do so.
 Scheduled demos are:

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| 10h00-12h00 | <p>The ARKIW platform, <i>I.Dudek & J.Y.Blaise</i> Immersive rendering experiences, <i>L. De Luca</i></p> |
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19h00 Workshop dinner , to be confirmed (rendez-vous at Etap-hotel lobby, Etap Hôtel Vieux port, 46 rue Sainte, 13001 Marseille)