

The Brick Country House

On using computer-games technology in architectural design education

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dipl. ing. jan frohburg



Agenda



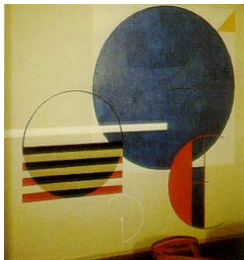
New Media in visualisation

- Rethinking architectural presentation



Using game engines in design education

- digital reconstruction of the Brick Country House



Outlook

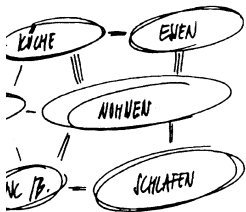
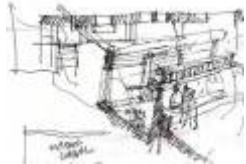
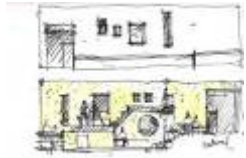
- New visualisation techniques

Media in architecture

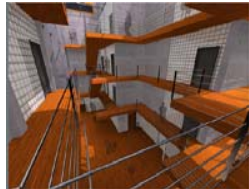
...a means of communication enabling people to understand one another

...“bearer of ideas and concepts” in the design process and understanding of architectural history

...“traditional” representational media include sketches, drawings, “haptic” models as well as textual descriptions



New Media



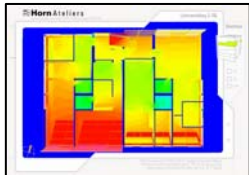
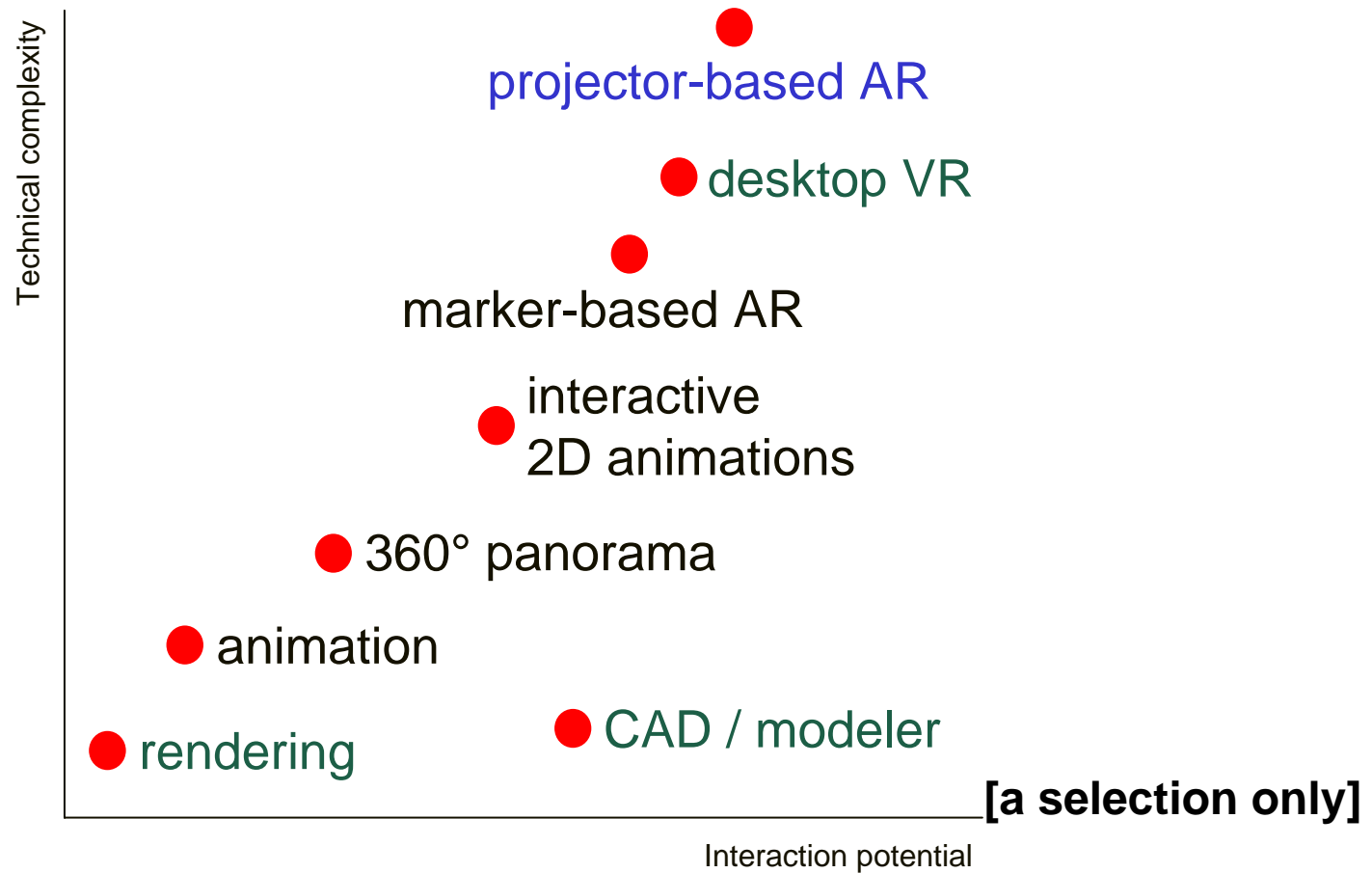
A definition of the term “New Media”

...all means and approaches employing new or renewed technologies and/or new forms of capturing, editing, storing, communicating and retrieving information and which result in new forms of representation

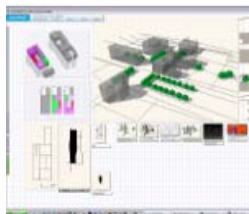
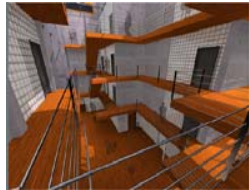
...(somewhat simplified) the “comprehensive computer”: uniting different media (multimedia), enabling interactive use (interaction), and incorporating the user (immersion)

New Media

Criteria - degrees of interaction



New Media



Break new ground in architectural education

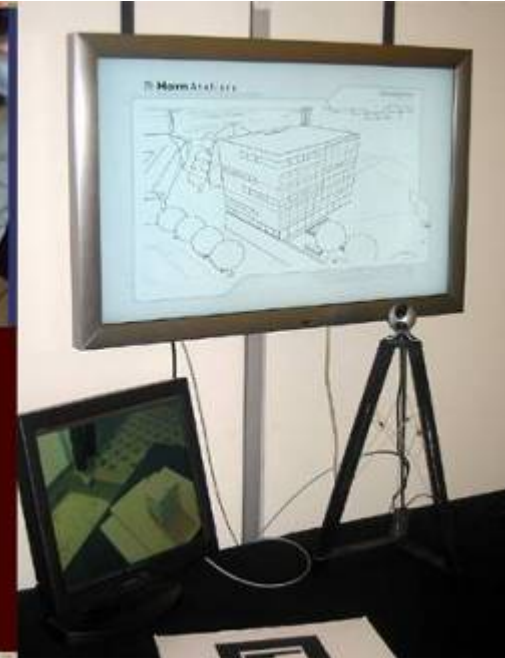
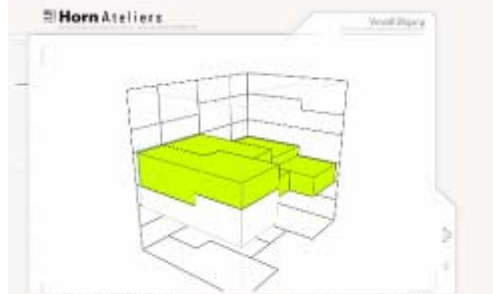
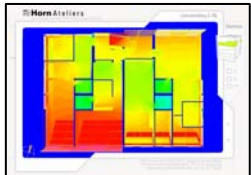
How do new media differ from previously and currently used media?

What do new media offer in comparison to “traditional” media?

How can new media be integrated into the design process?

What media applications should architecture students be proficient in at the start of the third millennium – and why?

New Media



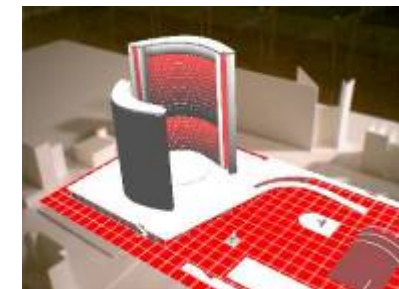
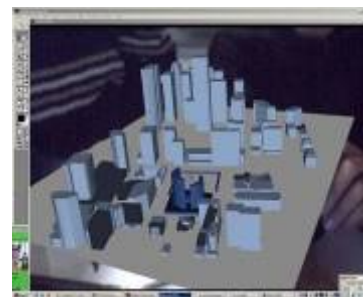
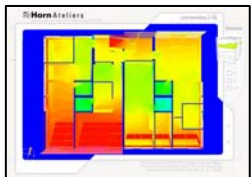
Diploma project - 2004

Turmhaus am Horn - digital architectural presentation
for a housing project

Andreas Beetz

Bauhaus Universität Weimar

New Media



Design project - 2004/2005
“Toronto. Moving the City”
“unfassbar” - virtual model building

New Media

3D game engine – architectural visualization



...multimedia-authoring tools, designed for creating interactive real-time 3D productions / presentations

Features include:

- ...real-time environment, e.g. first-person shooter
- ...import of different formats, e.g. 3ds or x-files
- ...programmable, e.g. graphical user interface language, script language, SDK's
- ...physics simulation
- ...database support

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Aim of the project...

...a digital reconstruction including computer-assisted analysis and interactive presentation

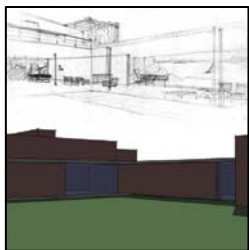
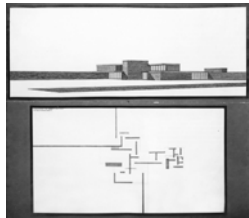
...teaching of theoretical foundations

...teaching of skills to use new media

...using new media as a tool in the work process

...discuss the new possibilities in visualisation

...critical assessment of New Media

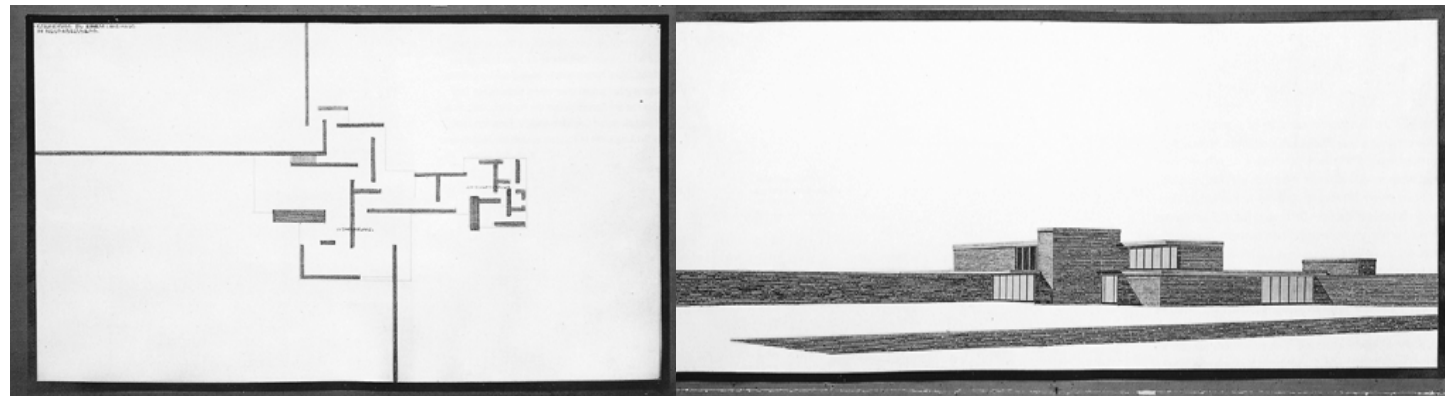
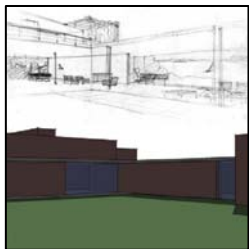
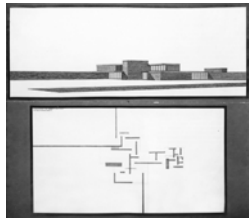


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Initial situation

...unrealised project / design

...two drawings / sketches only



Plan, not to scale

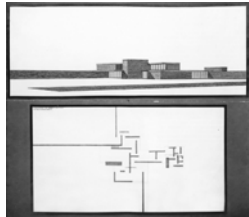
Perspective view

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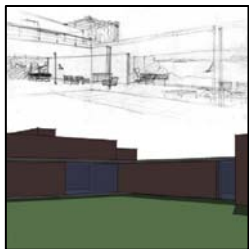
Stage 1 – Basis digital model



...generation of a 3D-model based on material available (plan by Blaser and critique by Tegethoff)



...comparison/overlay of perspective views with Mies' historic perspective

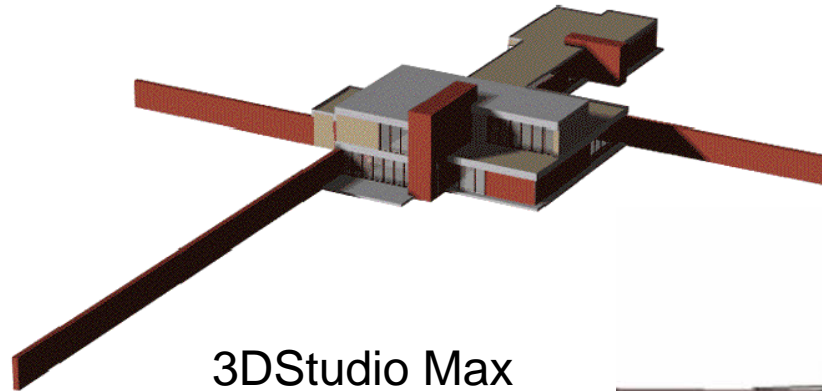
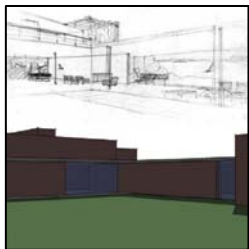
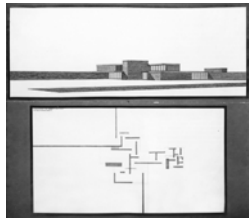


...adaptation of the digital model

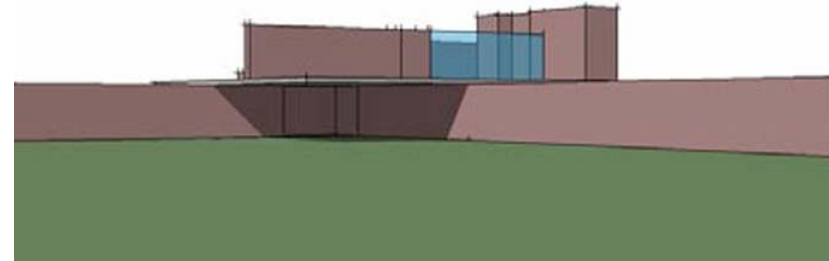


...lectures and exercises on CAD and modelling systems accompanied this phase

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3DStudio Max

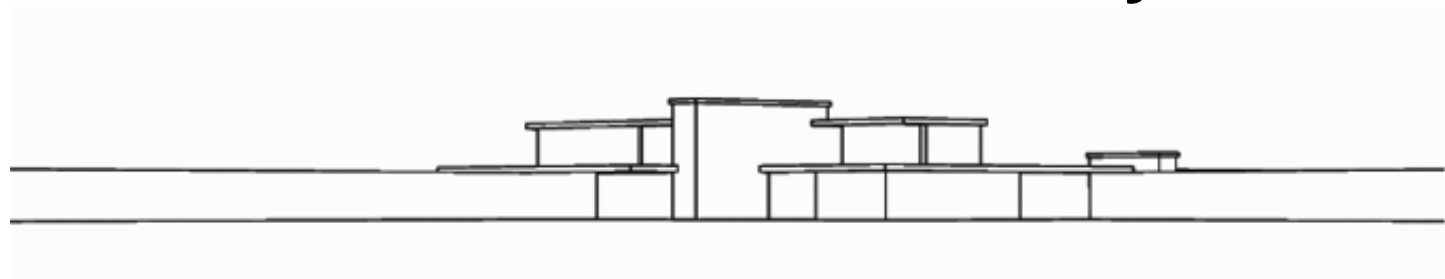
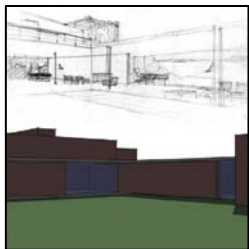
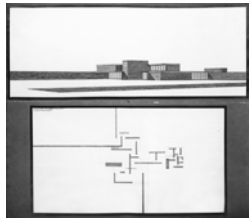


SketchUp

Basic digital model

based on available material in the form of a plan drawn by Blaser in 1965 and a critique of this plan by Tegethoff from 1981

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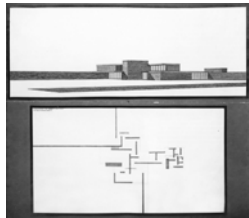


Juxtaposition of digital model and original perspective
(with additions in red to help determine room heights)

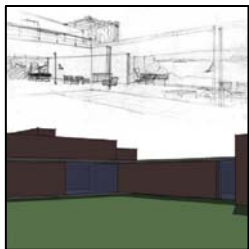
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Stage 2 – internet-based research

...research and analysis of historic photographs, sketches and drawings of potential reference buildings (internet and “traditional”)



...introduction to internet search strategies



...introduction to image editing techniques as well as OCR software and digitalisation methods for preparing the results of the researched information

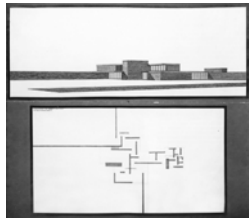


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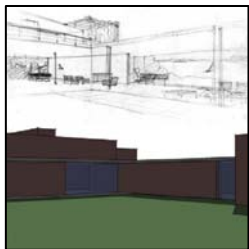
Stage 3 – computer-assisted analysis



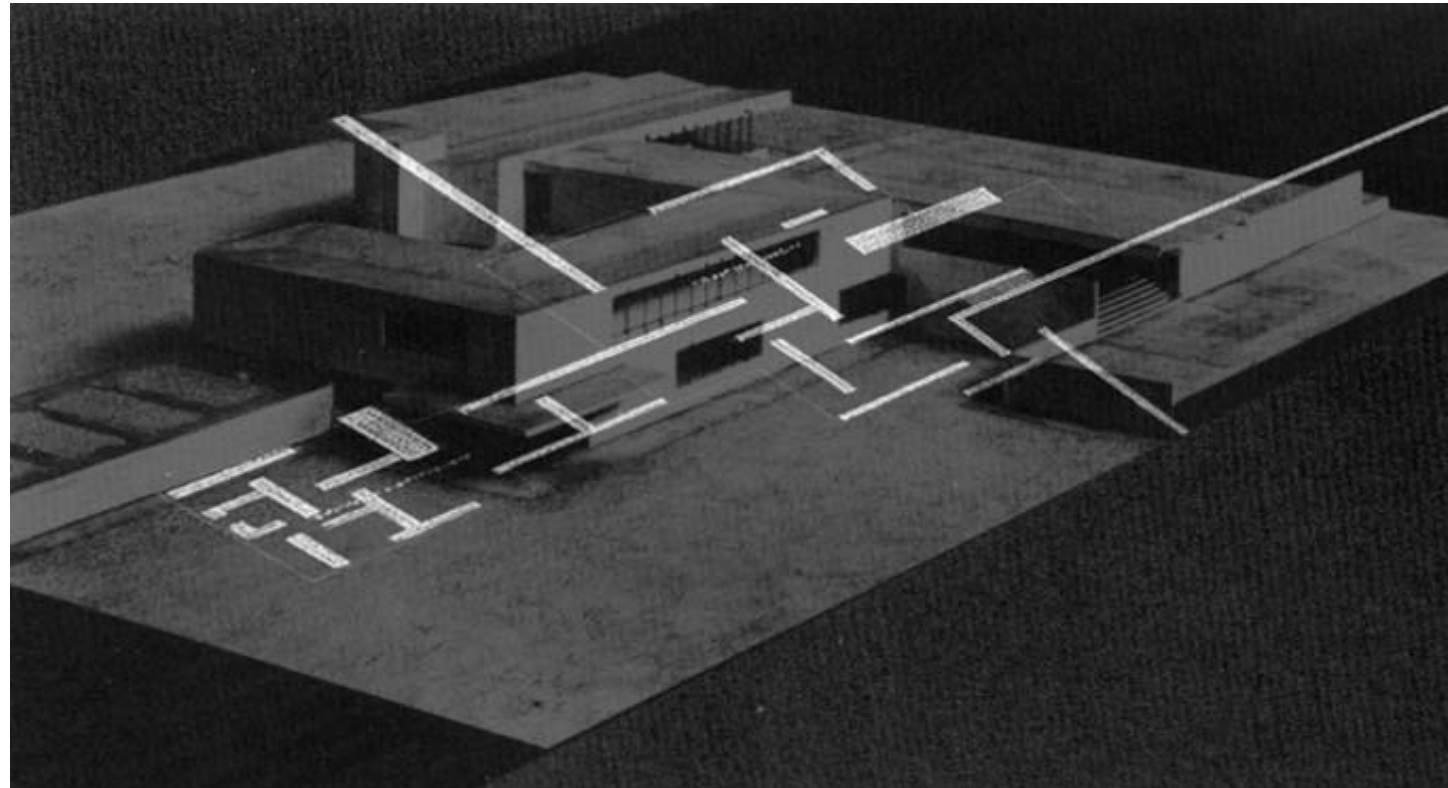
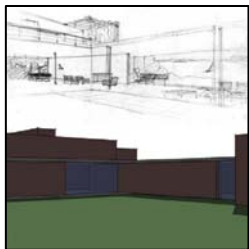
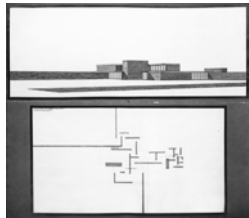
...generation of interior perspectives and their overlay / comparison with (edited) historic photographs



...extensive introduction to aspects of image editing and the problem of information visualisation, particularly the question of how to represent vague and inferred information

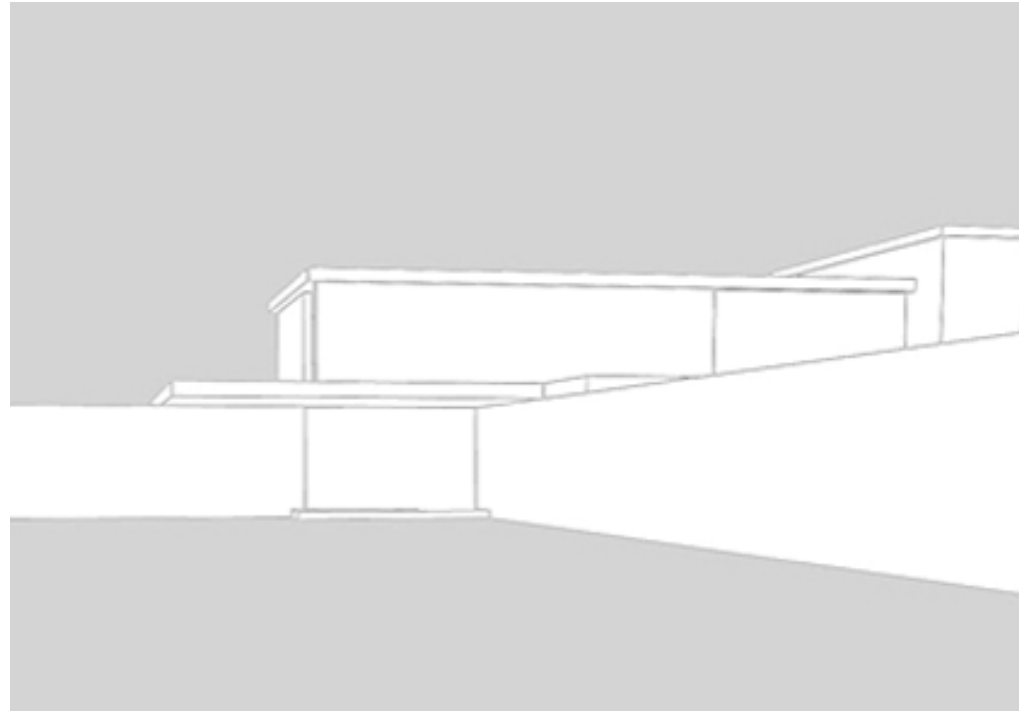
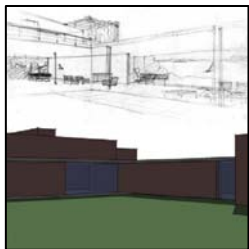
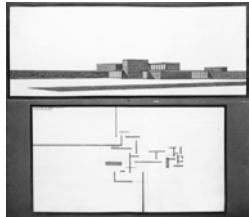


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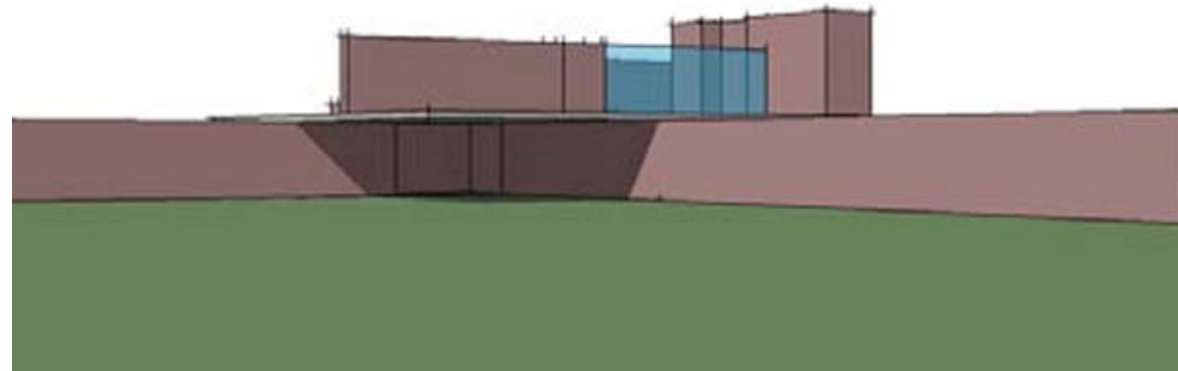
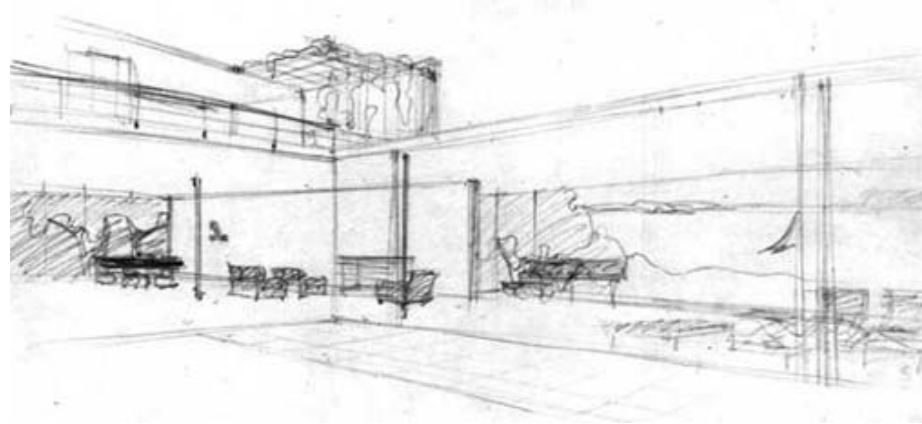
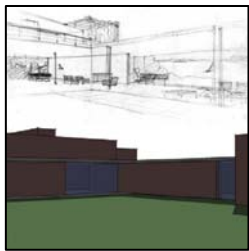
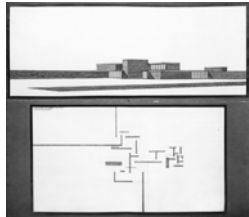
A comparison of the Concrete Country-House
and the Brick Country House
[Knorr/ Staudacher/ Baumeister]

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A comparison of entrance situations designed by
Mies van der Rohe
[Knorr/ Staudacher/ Baumeister]

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Digital sketch approximation of the design
reconstruction
[Ascher/ Droste]

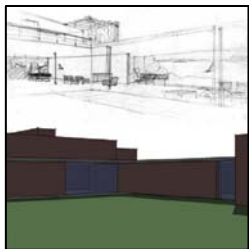
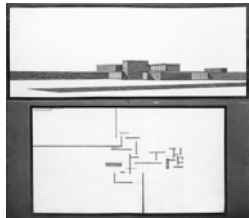
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Stage 4 – desktop VR | game engine

...preparation and presentation of the results of analytic work (process and final result)

...use of the “new” possibilities of visualisation and interaction

...new possibilities range from the purely visual (interactive generation of architectural sections, overlaying with sketches etc.) and the audio-visual (integration of video sequences) to interactive feedback (simulated haptic feedback)

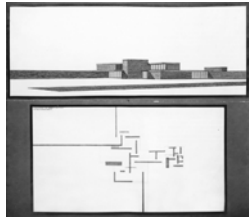


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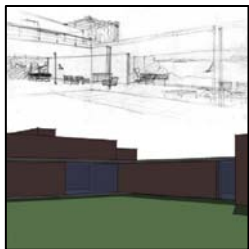
Stage 4 – desktop VR presentation



...basic introduction to the “Quest3D” game engine and graphics-oriented programming



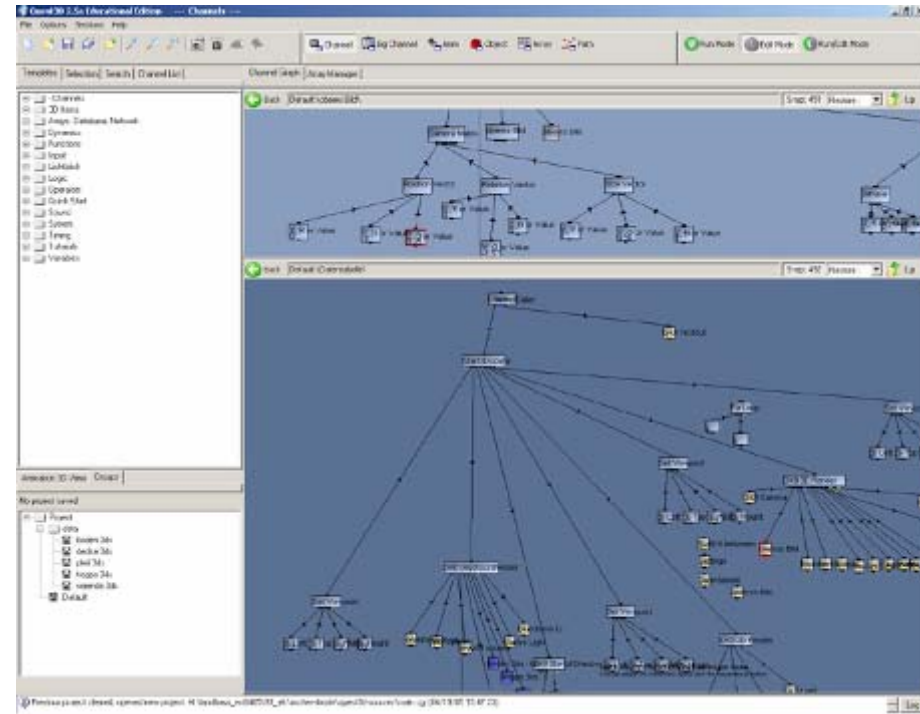
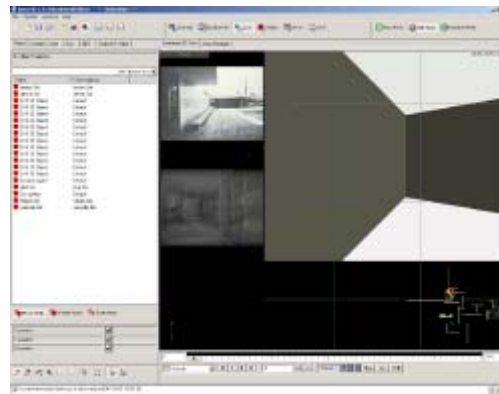
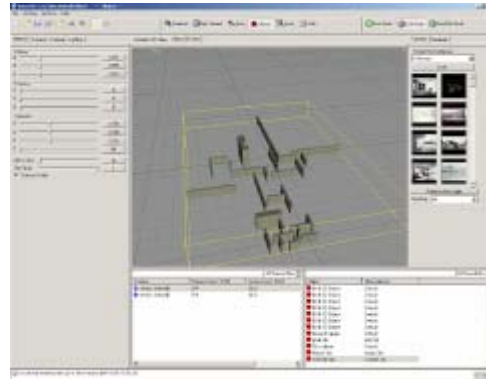
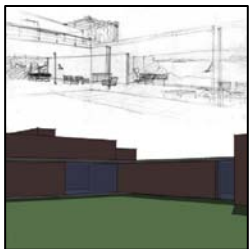
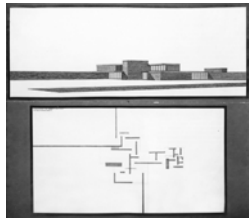
...tutorials in which the students introduced each other to the basic concepts and programming steps



...writing of a storyboard including a strategic concept for the entire presentation, interaction, navigation, user interface etc.

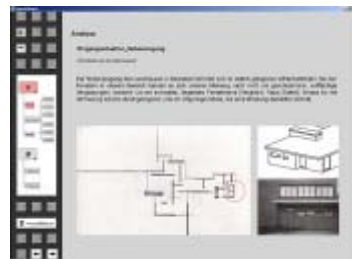
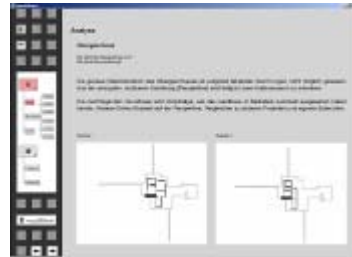
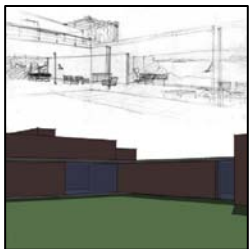
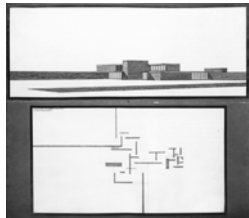


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Graphics-oriented programming interface

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Analyse

Vergleich: Landhaus in Backstein ↔ Villen und Landhausprojekte

Haupteingang

Landhaus in Backstein

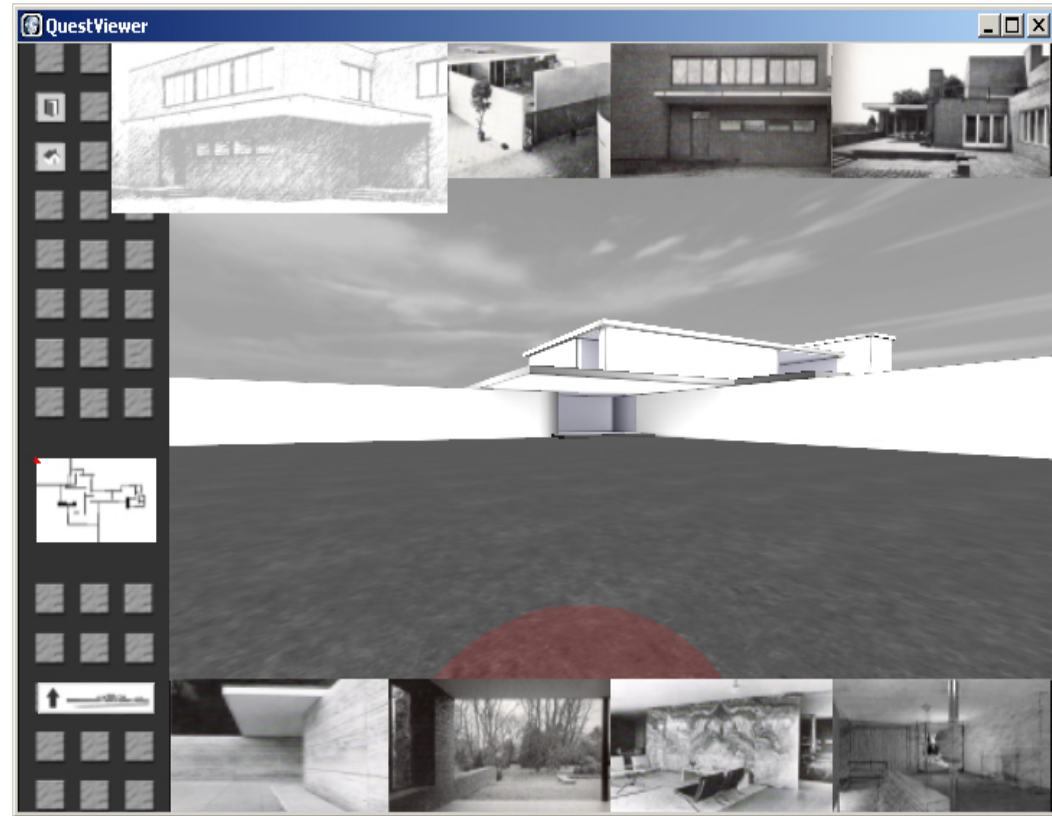
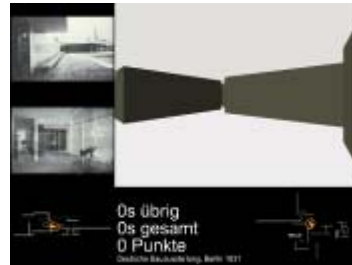
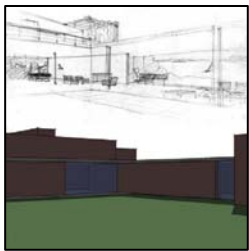
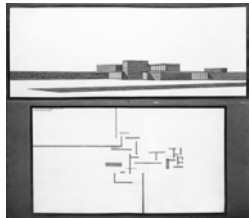
Haus Esters

Haus auf einer Escalator

The main interface features a vertical navigation bar on the left with a grid of icons and a central content area. The content area includes a large architectural drawing of a house with a brick facade, a photograph of a modern brick house (Haus Esters), and a sketch of a house on a hillside (Haus auf einer Escalator). The interface also includes a title 'Analyse' and a subtitle 'Vergleich: Landhaus in Backstein ↔ Villen und Landhausprojekte'.

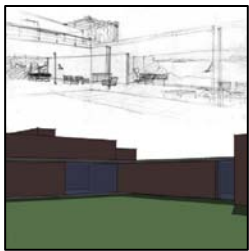
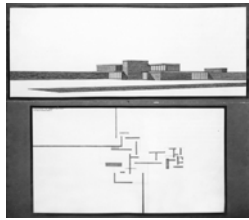
“Traditional” digital presentation

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„New“ digital presentation

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Résumé and Findings - architectural students

...learn to examine and structure a problem and to develop strategies

...develops similar skills as those required for solving architectural design problems

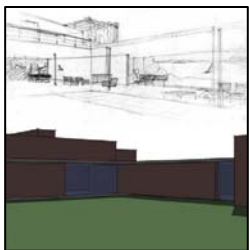
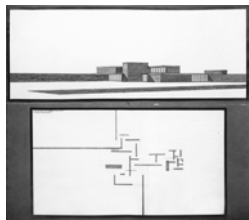
- conceptual clarity
- structuring of the ideas
- evaluation of the results

...gain an understanding of the structure and functional principles of different techniques

...learn to critically examine universal promises propagated by marketing companies

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Résumé and Findings - teaching stuff



...design project with “new media” requires similar skills to “traditional” media

...many students were overwhelmed by the wide range of possibilities offered by “new media”

...not all possibilities were understood and used productively or appropriately

...provide students with possible specialization routes for their later career

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