

THE INSPIRING MEDIATION OF ARCHAEOLOGICAL HYPOTHESES BY ARCHITECTURAL ABSTRACTION

Dominik LENGYEL

Catherine TOULOUSE

BTU Brandenburg University of Technology, Institute for Building and Art History, Faculty for Architecture, Civil Engineering and Urban Planning, Chair for Architecture and Visualization, Cottbus-Senftenberg, Germany

Abstract: Architecture is the archetype of the synthesis of art and science. Architecture creates spaces, archaeology creates hypotheses of a lost reality. Since the evolution of the digitalization both disciplines emphasized different topics. Architecture focused on formal design, archaeology on registration and annotation. Architecture and archaeology coincide in the majority in using photorealistic imagery developed with the help of computer aided design and rendering applications for their mediation. Imaginary projects and hypothetical assumptions both appear in a way that promises more than would be possible in a responsible way. But other than in architecture where the promises of photorealistic visualizations could equal the latter realization, in archaeology photorealistic visualizations are always far away from their scientific content. This is where we developed a method of visualizing archaeological hypotheses concerning lost architecture. We re-established traditional methods of abstract modeling and architectural photography, a combination that relies on traditional methods of perception, of historical clay models and contemporary photographic compositing, in order to provoke the traditional perception of architecture. Visualizing uncertain knowledge via abstract geometry also provokes self-reflection by the spectator. Science becomes obvious, and science becomes a work of art, simply because a verbal hypothesis has to be made visible by an architect familiar in designing geometry that provokes ideas of architecture. The presentation aims to illustrate this method by projects developed by the authors in cooperation with archaeological research institutions like Cologne Cathedral and its Predecessors, the Palatine Palaces in Rome and the Ideal Church of Julius Echter.

Keywords: Architecture, Visualization, Uncertainty, Hypotheses, Virtual Photography, Cultural Heritage

COMMONS

Architecture is the archetype of the synthesis of art and science. If architectural methods help to mediate archaeological knowledge, art and science get even closer. Both disciplines have common interests. Architecture creates spaces, first in the mind, then in reality. Archaeology creates spaces in the mind as hypotheses of a lost reality. And both disciplines traditionally use similar tools like measures, drawings and models. Since the evolution of the digitalization both disciplines emphasized different topics. Architecture focused on formal design, archaeology on registration and annotation. Still both disciplines used the ongoing technological developments to optimize their digital outcomes. And still, architecture and archaeology coincide in the majority in using photorealistic imagery developed with the help of computer aided design and rendering applications for the mediation of their respective contents, that is hypotheses for archaeology or planned projects for architecture. Imaginary projects and hypothetical assumptions both appear in a way that promises more than would be possible in a responsible way driven by science.

LIMITS

But other than in architecture where the promises of a photorealistic visualization could meet the needs and could even equal the latter realization – sometimes in an unprecedented accuracy that provokes an impression of astonishment feeling like standing in a computer rendering – in archaeology a photorealistic visualization is always and necessarily far away from its scientific content, since reality is far too complex to be the result of serious scientific research. In practically any archaeological case of hypotheses concerning lost architecture, its original appearance as presented in photorealistic visualizations will never be known at all. It is simply impossible to ever find out exactly how lost buildings or their context, not to mention any kind of life around, people and their habits, traces of use and so forth looked like. This renders a fundamental distinction between projecting architecture for the future and researching archaeology of the past also in their respective visualization. Photorealistic visualizations in archaeology necessarily mislead both, scientists and the broader audience, their enormous amount of pure phantasy not only visually dominates any scientific core. They are suggestive in a way that the spectator cannot help to believe what he or she sees. Any reflection and notion of its scientific grounds, of its contemporary interpretation or even of any scientific uncertainty or ambiguity, even of science itself, is suppressed and superimposed by unnecessary, purely speculative content, created by the phantasy of an illustrator.

GAMES

There is of course a demand of visual material that resembles a presumed reality that is the broader public audience. Realistic imagery is appealing as it addresses everybody's natural participation. And as historical movie dramas have their own history of cinematographic reception, there is even a large influence of nostalgia oriented to past lives. The more personal a story is told, the more the spectator gets involved and the more she or he can identify herself or himself with the protagonists of the story. Realistic imagery resembles these stories told by the movie industry over the last century. Contemporary computer games took over the leadership in photorealistic historical imagery to make the game player fully immerse into the artificial universe. They make the player rather emotionally feel than intellectually reflect the visually perceived world which augments the emotional acceptance of the imagery even further. Still, the lack

of reflection, and furthermore, the lack of an apparent need for reflection does not meet the needs of science nor the needs of the mediation of specific archaeological hypotheses.

METHOD

This is where we developed a method of visualizing archaeological hypotheses concerning lost architecture. This does also contain architecture that is only partly lost or damaged. In this case, in order to provide a consistent vision, even findings are not represented as they are, that is photorealistically or even simply photographed, since this would make the coincident rupture between preserved and lost parts more important than the overall hypothesis. On the contrary, we re-established the two traditional methods abstract – modeling and architectural photography – and created a new kind of combination of the two that relies on two equally traditional methods of perception, that is of historical clay models on one hand and contemporary photographic compositing on the other hand, in order to use and trust on the traditional perception and interpretation of architecture. This is comparable to black and white photography. Objectively, black and white photography of polychromic objects or scenery does not depict reality accordingly and could therefore be rejected by spectator as irrelevant, uninteresting or even false. But due to our tradition of black and white photography, everybody within our broader cultural context naturally accepts black and white photography as totally natural, plausible, story-telling, concrete and even – and this is the most relevant part – realistic. The abstraction of the photographed geometry serves as a clear statement, a literal translation of scientific knowledge including its uncertainty. Scientific knowledge in archaeology contains several degrees of certainty as of findings found in situ or on remote sites, obvious completions like walls on foundations, necessary complementations like roofs on walls as well as vague but justified assumptions like tympani on columns whose alternative solutions – or rather proposals – can even contradict each other. This altogether well call uncertain knowledge, an expression that does not define all knowledge as uncertain but emphasizes that most of archaeological knowledge – everything except finds in situ – is to a certain and varying degree uncertain.

REFLECTION

Visualizing uncertain knowledge via abstract geometry provokes self-reflection by the spectator. It is the visual arts again that similar to black and white photography provide a visual tradition in abstraction. The sculpture „Three Streets“ by Hubert Kiecol evokes a clear architectonic concept with a minimum of geometric gesture. Four prisms resemble what we immediately identify as buildings, even if observed from above as they are usually presented in museums (fig. 1). Our method of virtual photography that underlines the importance of eye level perspectives would project this sculpture as if it was real and built architecture simply by lowering the point of view to an appropriate pedestrian's eye level (fig. 2). The obvious lack of realism makes the spectator think about what he or she sees – think about the content, but also think about the context and the origins on the presented content. Science becomes obvious, and if presented properly, science becomes a work of art, simply because a verbal hypothesis has to be made visible by somebody who is familiar in designing geometry that provokes certain ideas of architecture, just as architects do in projecting architecture to their clients later to be realized.

This way, abstract geometry presented as an architectural project serves as inspiration and therefore calls for interaction. It inspires archaeologists to think further. Being able not only to think about other archaeologists' hypotheses, but being able to see them, and this in a direct and not distorted way, not



Fig. 1



Fig. 2

covered by pure phantasy, inspires for ongoing hypotheses. These visualizations work as scientific tools. Just as for archaeologists, these visualizations work as mediators of archaeology, of archaeologists' hypotheses themselves as well as of their hypothetical character as such. This way, even the broader audience gets an idea of what archaeology is, how it works, how archaeologists think and work, and what uncertainty is about, or even further, what science is about, and that science does not provide simple answers at all.

The core approach though is not to only literally depict the degree of certainty of every single architectural part of every building, but to create visions by abstract scenes, to literally translate verbal hypotheses to their visual representation only as the first step, and then, in a second step, to project this abstract geometry as if it was realized architecture. We call this virtual photography, as we do not consider the virtual model as the final piece of mediation, but its projection as an equally important counterpart, its complement. Photographed just as reality, abstract geometry can entirely unveil its architectural content. This also equals the archaeologists' imagination as hypotheses of lost buildings do not include the visual presence of markers, building phases, probabilities and alternative solutions. On the contrary, every single hypothetical state of a building is developed, imagined and described as a consistent entity, a respective world by its own, presenting each hypothetic abstract world as if it was real. By working as virtual photographers, another strong impetus of art influences the results. Sculptural design and virtual photography together present science in a way that addresses all senses, not only the severe rational scientific perception but also the emotional perception of space. The emotional impact is of course of different sort compared to photorealism and rather comparable to the emotional impact of abstract art. Given the example of the famous black square by Kasimir Malevich, abstraction can, even if this might depend on the level of cultural experience and education of the spectator, evoke or not evoke inspiration. But independent from the emotional impact, due to the use of traditional methods of architectural photography, digital technologies are not primarily perceived as digital media but as mediators of cultural heritage. In composing photographic imagery based on virtual and abstract geometry, the results resemble to a large extent graphic design and illustration, so that several artistic disciplines are combined in order to serve the mediation of archaeological science. In creating new formal elements, basic abstract objects that represent abstract verbal archaeological entities, the challenge consists of creating a visual terminology that in the best case literally depicts the verbal archaeological terminology. The importance of abstraction in verbal language is often underestimated, as it is used permanently without being explicitly mentioned. Hypotheses that describe a rectangle of columns surrounding a cell covered by a roof give quite a clear image of a building even if almost nothing has been defined. Even sketches can be designed in a way that not much details than the overall dimensions of cell, columns and roof are defined. A set of sketches though could go further and provide a series of impressions rendering the hypotheses more concrete. An abstract three-dimensional model is – in some way – nothing else than a spatially arranged series of

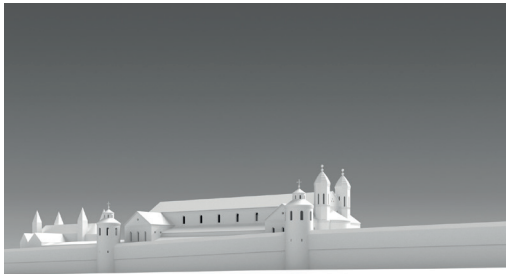


Fig. 3



Fig. 4



Fig. 5

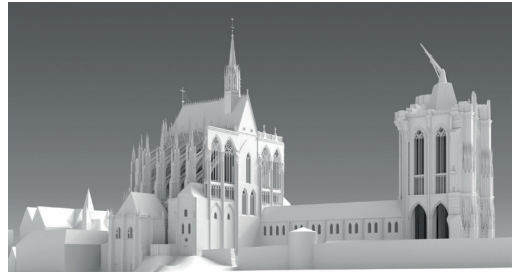


Fig. 6



Fig. 7

rough sketches. The idea behind abstract models, not only for the purpose of mediating archaeology, but also for the purpose of proposing an architectural project, is to provide consistency between the sketches, a kind of visual trust providing the spectator the certainty that at least the geometric dimensions of the proposed parts is reliable. This is an important and original architectural demand, and this approach is very close to the everyday architectural effort, that is to design space in order to create visions in the spectators' imagination, to make the spectator think about what she or he sees, to provoke inspiration and interaction, usually the client of the architect.

RESULTS

The visualization of Cologne Cathedral and its Predecessors has been asked for by the Cathedral administration in order to rethink the public mediation of the world heritage site's history for its visitors. The former visualization showed the building phases as axonometric bird's eye views without context. The new approach changed both. The axonometries were complemented by pedestrian eye's levels from the

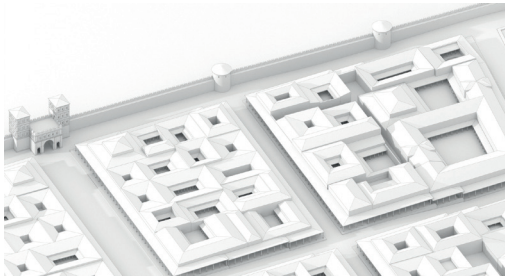


Fig. 8

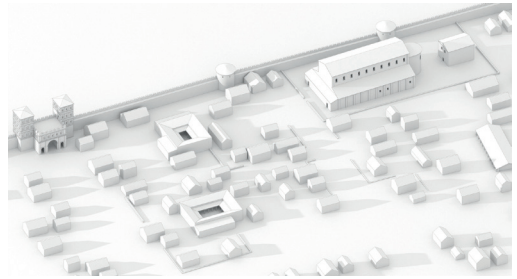


Fig. 9

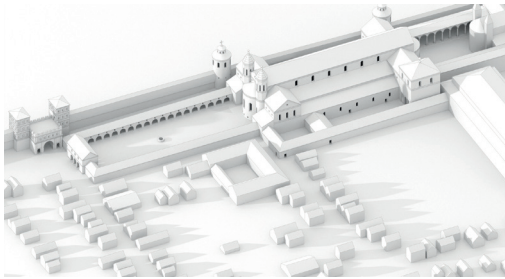


Fig. 10

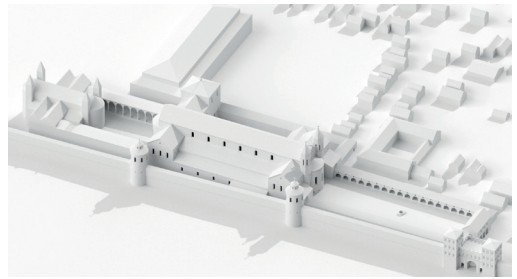


Fig. 11



Fig. 12



Fig. 13

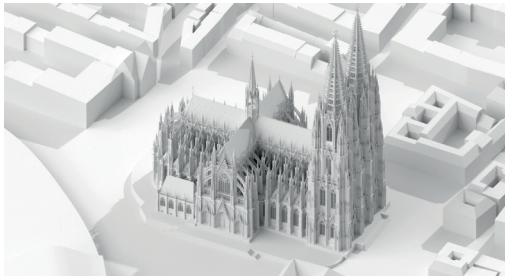


Fig. 14

ground, from the city walls and in one particular case from another church tower (fig. 3–7). All building phases were put in the context which had always been urban from the Roman times when latter baptismal font had still been a garden basin until today (fig. 8–14). This already offers for the first time to experience and value the church's volume and shape relative to its surroundings leading to further con-



Fig. 15



Fig. 16

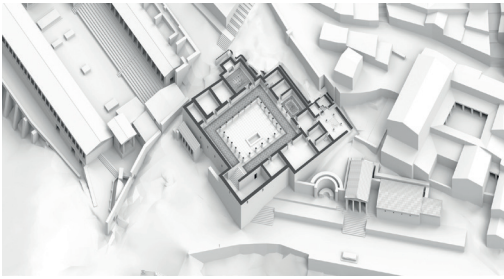


Fig. 17



Fig. 18

siderations. As example for the re-interpretation of a state of knowledge it was the pedestrian eye level's perspective that could explain the appearance of two towers above the nave of the Hildebold Cathedral depicted in the Hillinus Codex, a medieval drawing about the donation of this last predecessor of today's Cathedral. It came out that these towers belong to the city wall instead of to the church that in return did not have crossing towers any more (fig. 15).

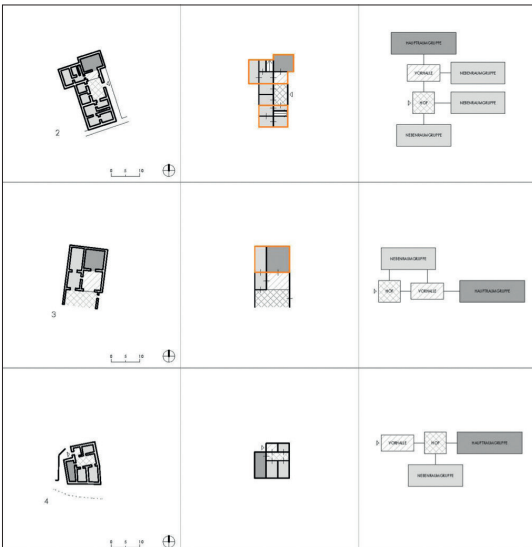


Fig. 19

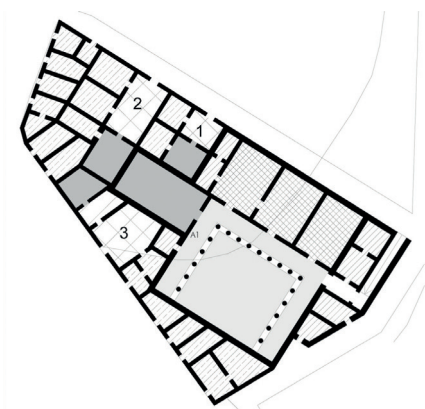


Fig. 20



Fig. 21

The visualization of the antic metropolis Pergamon that has been created within an Excellence Cluster called TOPOI funded by the German Research Foundation DFG and continues as an ongoing research project between our University and the German Archaeological Institute's department in Istanbul, Turkey, re-arranges all known historical and contemporary finds and partial reconstruction drawings in one single and general 3D model based on a terrain model registered with GPS technology (fig. 16). Incompatible overlaps in the drawings had to be leveled. Well known building complexes appeared in their urban context including neighboring temples but also profane buildings (fig. 17). Even if all details had been known by archaeologists before, the pedestrian's eye level view from the opposite hill had not been literally visible since 200 AD (fig. 18). The contrary between former visualizations and this actual and official one is the dense settlement of practically the whole mountain's southern and eastern slopes nearly fully covered with buildings. Here the task was again to develop a city texture that follows the known rules of city structures of the time without giving the impression that every single house would be known. On the contrary, it was mostly fractions of drainage and building corners that supposed a grid that the texture had to fill. A well preserved and excavated area on the higher parts of the eastern slope allowed for examining the geometric and topologic rules (fig. 19). Starting with a single section (fig. 20) and its extrapolation over the lower eastern slope (fig. 21), a spatial city texture could be developed that followed all known rules while obviously staying uncertain in detail (fig. 22). The juxtaposition of traditional photographic methods like shift lenses (fig. 23) and the consideration of space perception through axonometries that refuses the spectator a position in space (fig. 24) assure the viewer about the clear distinction between historically relevant points of view and contemporary analytical distant observation.

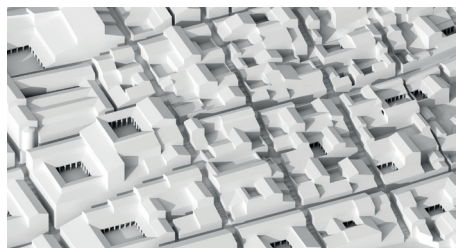


Fig. 22



Fig. 23

The visualization of the Palatine Palaces in Rome for the German Archaeological Institute consist of animated common bird's eye views (fig. 25) showing the changes over four states of development accompanied by a 3D print model (fig. 26) and eye level perspectives (fig. 27–28). The method remained the same as before but a very slowly sideways moving camera added a subtle movement to the images that resembles human eye's or head's movement rendering the scenes more spatial than still images. As the exhibition visitor could meanwhile wander around the 3D print, the human interaction raised the spatial perception. In the case of the palace's reception courts it becomes obvious that abstract geometry – that excludes not only material but first of all historic personnel and any historic traces of use – is capable of serving as inspiration for today's architecture as basic topics like the dimension of space, the composition of volumes, the transition from inside to outside, the lighting and the casting of shadows are discussed (fig. 29).

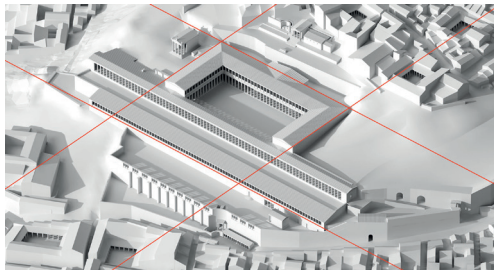


Fig. 24

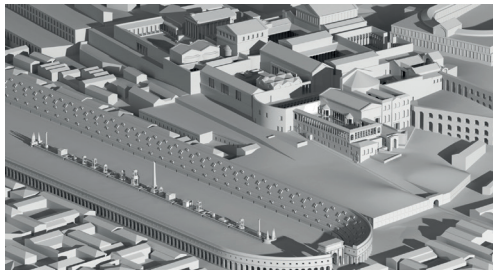


Fig. 25

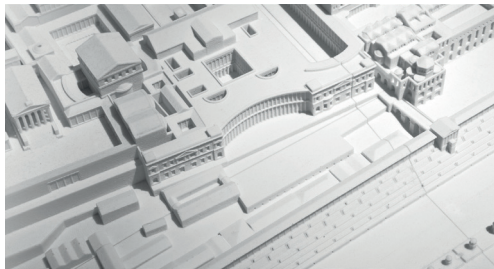


Fig. 26



Fig. 27



Fig. 28



Fig. 29



Fig. 30



Fig. 31

the several hundred similar resembling but individual churches he had built within a few years. The way to mediate an idea instead of a built church was to let the user relive the process of design. An interactive VR application (fig. 30) let the user compose abstract building parts that all churches possessed that is nave, tower, choir and sacristy in the scale 1 to 100 – with some guidance that in a usual model would technically not be possible and then, after successful composition, let the user experience the same church in original scale. In every phase the visitor is exposed to abstract geometry assuring that the impression of an idea (fig. 31). This necessary distance is also applied in the interactive behavior of the church that includes ambiguities that cannot be resolved like the coloring of the stone – red or yellow – or the window traceries. The enormous variability of Echter's window traceries are that characteristic to his churches that the ideal church had to have the multitude of forms inscribed. Consequently, the user can interactively alter the traceries in VR from the outside and from the inside (fig. 32).



Fig. 32

CONCLUSION

Abstraction clarifies – it separates the ideal from the arbitrary. This demands a clear distinction that depends on well-founded hypotheses and a straight-forward intention of what to mediate. It is mostly architectonic structures that can be mediated with abstract geometry, but even this gives clear ideas of spatial compositions, especially when analytical axonometries are combined with immersive perspectives. The tradition of the visual perception of both, traditional architectural scale models of all scales and materials from urban scale to ornaments and black and white photography, allow a visual reference that suggests a lot without revealing more than necessary. This serves as a visual complement for verbal hypotheses in two directions. Scientists see their own argumentation in a different language that is the visual language. They are able to discuss their hypotheses visually but as precisely as with their written words. The broader public audience sees the same argumentation embedded in its natural context that is scientific – uncertain – knowledge. Instead of being misled by purely speculative scenery, the visualizations talk about the scientific knowledge and its uncertainty at the same time. The nature of science remains visible and science keeps its complexity.

ILLUSTRATIONS

1: Hubert Kiecol, Three streets, 1989, 25 x 50 x 50 cm, Museum of Modern Art Vienna. Foto: Dominik Lengyel

Хуберт Кикол, Три улице, 1989, 25×50×50 цм, Музеј модерне уметности Беч. Фото: Доминик Ленгиел

2: Hubert Kiecol, Three streets, 1989, 25 x 50 x 50 cm, Museum of Modern Art Vienna. Foto: Dominik Lengyel

Хуберт Кикол, Три улице, 1989, 25×50×50 цм, Музеј модерне уметности Беч. Фото: Доминик Ленгиел

3: Cologne 9th to 12th century, Lengyel Toulouse Architects Berlin

Келн од 9. до 12. века, Ленгиел Тулуз Архитекте Берлин

4: Cologne 1248–1250 AD, Lengyel Toulouse Architects Berlin

Келн 1248–1250 године, Ленгиел Тулуз Архитекте Берлин

5: Cologne 1320 AD, Lengyel Toulouse Architects Berlin

Келн 1320 АД, Ленгиел Тулуз Архитекте Берлин

6: Cologne 1320–1440 AD, Lengyel Toulouse Architects Berlin

Келн 1320–1440 године, Ленгиел Тулуз Архитекте Берлин

7: Cologne 1440–1520 AD, Lengyel Toulouse Architects Berlin

Келн 1440–1520 године, Ленгиел Тулуз Архитекте Берлин

8: Cologne 1st to 4th century AD, Lengyel Toulouse Architects Berlin

Келн од 1. до 4. века нове ере, Ленгиел Тулуз Архитекте Берлин

9: Cologne 6th to 7th century AD, Lengyel Toulouse Architects Berlin

Келн 6. до 7. века нове ере, Ленгиел Тулуз Архитекте Берлин

10: Cologne 1025 AD, Lengyel Toulouse Architects Berlin

Келн 1025 године, Ленгиел Тулуз Архитекте Берлин

11: Cologne 1025 AD, Lengyel Toulouse Architects Berlin

Келн 1025 године, Ленгиел Тулуз Архитекте Берлин

12: Cologne 1320 AD, Lengyel Toulouse Architects Berlin

Келн 1320 године, Ленгиел Тулуз Архитекте Берлин

13: Cologne 1440–1520 AD, Lengyel Toulouse Architects Berlin

Келн 1440–1520 године, Ленгиел Тулуз Архитекте Берлин

14: Cologne 1842–1880 AD, Lengyel Toulouse Architects Berlin

Келн 1842–1880 године, Ленгиел Тулуз Архитекте Берлин

15: Cologne 1025 AD, Lengyel Toulouse Architects Berlin

Келн 1025 АД, Ленгел Тулуз Архитекте Берлин

- 16: Pergamon 200 AD, Lengyel Toulouse Architects Berlin
Пергамон 200. године, Ленгиел Тулуз Архитекте Берлин
- 17: Building Z in Pergamon, Lengyel Toulouse BTU Cottbus
Зграда Z у Пергамону, Ленгиел Тулуз БТУ Котбус
- 18: Pergamon skyline, Lengyel Toulouse BTU Cottbus
Пергамон, хоризонт, Ленгиел Тулуз БТУ Котбус
- 19: Analysis of excavated urban structures in Pergamon, Lengyel Toulouse BTU Cottbus
Анализа ископаних урбаних структура у Пергамону, Ленгиел Тулуз БТУ Котбус
- 20: Artifical urban texture, Lengyel Toulouse BTU Cottbus
Вештачка урбана текстура, Ленгиел Тулуз Котбус
- 21: Extrapolated urban texture on hypothetical grid in Pergamon, Lengyel Toulouse BTU Cottbus
Екстраполирана урбана текстура на хипотетичкој мрежи у Пергамону, Ленгиел Тулуз БТУ Котбус
- 22: Spatial model of hypothetical urban texture in Pergamon, Lengyel Toulouse BTU Cottbus
Просторни модел хипотетичке урбане текстуре у Пергамону, Ленгиел Тулуз БТУ Котбус
- 23: Sanctuary of Traian in Pergamon, shift lens photography, Lengyel Toulouse BTU Cottbus
Трајаново светилиште у Пергамону, фотографија са објективом са померањем, Ленгиел Тулуз БТУ Котбус
- 24: Gymnasium in Pergamon, axonometric bird's eye view, Lengyel Toulouse BTU Cottbus
Гимназија у Пергамону, аксонометријска птичја перспектива, Ленгиел Тулуз БТУ Котбус
- 25: Palatine Palaces and Circus Maximus from above, Lengyel Toulouse Architects Berlin
Палатинске палате и Циркус Максимус одозго, Ленгиел Тулуз Архитекте Берлин
- 26: Palatine Palaces and Circus Maximus as 3D print, Lengyel Toulouse Architects Berlin
Палатинске палате и Циркус Максимус као 3Д штампа, Ленгиел Тулуз Архитекте Берлин
- 27: Circus Maximus in front of the Palatine Palaces, imperial times, Lengyel Toulouse Architects Berlin
Циркус Максимус испред Палатинских палата, доба империје, Ленгиел Тулуз Архитекте Берлин
- 28: Water basin in Domus Severiana in the Palatine Palaces, Lengyel Toulouse Architects Berlin
Базен са водом у Северовој кући у Палатинским палатама, Ленгиел Тулуз Архитекте Берлин
- 29: Reception courts in the Palatine Palaces, Lengyel Toulouse Architects Berlin
Улазно двориште у Палатинским палатама, Ленгиел Тулуз Архитекте Берлин
- 30: Elevations of the presumed ideal church by Julius Echter, Lengyel Toulouse Architects Berlin
Пројекат замишљене идеалне цркве Јулиуса Ехтера, Ленгиел Тулуз Архитекте Берлин
- 31: Nave and choir of the presumed ideal church by Julius Echter, Lengyel Toulouse Architects Berlin
Брод и хор замишљене идеалне цркве Јулиуса Ехтера, Ленгиел Тулуз Архитекте Берлин
- 32: VR experience in the presumed ideal church by Julius Echter, Lengyel Toulouse Architects Berlin
ВР представљање замишљене идеалне цркве Јулиуса Ехтера, Ленгиел Тулуз Архитекте Берлин

LITERATURE

- Laufer, Eric; Lengyel, Dominik; Pirson, Felix; Stappmanns, Verena; Toulouse, Catherine (2012): Die Wiederentstehung Pergamons als virtuelles Stadtmodell. In: Ralf Grüßinger, Volker Kästner und Andreas Scholl (Hg.): Pergamon. Panorama der antiken Metropole : Begleitbuch zur Ausstellung. Unter Mitarbeit von Ingrid Geske und Johannes Laurentius. 2., überarbeitete Auflage. Petersberg: Michael Imhof Verlag, S. 82–86.
- Lengyel, Dominik (2017): Die Unschärfe in der Visualisierung von Ktesiphon. In: Andreas Schwarting und Noline-Maria Bauers (Hg.): Bericht über die 49. Tagung für Ausgrabungswissenschaft und Bauforschung 2016. Koldewey-Gesellschaft. Vom 4. bis 8. Mai 2016 in Innsbruck, S. 173–179.
- Lengyel, Dominik; Ristow, Sebastian; Toulouse, Catherine (2010): Rekonstruktionen zur Baugeschichte des Kölner Domes. In: Thomas Otten, Hansgerd Hellenkemper, Jürgen Kunow und Michael M. Rind (Hg.): Fundgeschichten – Archäologie in Nordrhein-Westfalen. [Ausstellung Köln, Römisch-Germanisches Museum der Stadt Köln, 19. März bis 14. November 2010; Ausstellung Herne, LWL-Museum für Archäologie – Westfälisches Landesmuseum, 16. April 2011 bis 20.

- November 2011]. Köln, Mainz: Römisch-Germanisches Museum der Stadt Köln; von Zabern (Schriften zur Bodendenkmalpflege in Nordrhein-Westfalen, Bd. 9), S. 546–547.
- Lengyel, Dominik; Toulouse, Catherine (2011): Die Gestaltung der Vision Naga. Designing Naga's Vision. In: Karla Kroeper, Sylvia Schoske und Dietrich Wildung (Hg.): Königsstadt Naga. Grabungen in der Wüste des Sudan ; [erscheint anlässlich der Sonderausstellung Königsstadt Naga – Grabungen in der Wüste des Sudan, München, Staatliches Museum Ägyptischer Kunst, 15. April – 31. Juli 2011; Berlin, Kunstforum der Berliner Volksbank, 31. August – 18. Dezember 2011] = Naga – Royal City. München, S. 163–175.
- Lengyel, Dominik; Toulouse, Catherine (2013): Die Bauphasen des Kölner Domes und seiner Vorgängerbauten. Gestaltung zwischen Architektur und Diagrammatik. In: Dietrich Boshung und Julian Jachmann (Hg.): Diagrammatik der Architektur. Paderborn: Fink (Morphomata, 6), S. 327–352.
- Lengyel, Dominik; Toulouse, Catherine (2013): Digitales Modell Domchorinnenraum 1856. In: Stefan Klösches und Eberhard Metternich (Hg.): In aeternum cantabo. Zeugnisse aus 1300 Jahren kölnischer DomMusikGeschichte ; Ausstellung anlässlich des 150-jährigen Jubiläums des Kölner Domchores vom 1. November 2013 bis 7. Januar 2014 in der Erzbischöflichen Diözesan- und Dombibliothek Köln. Köln: Kölner Dommusik, S. 150–154.
- Lengyel, Dominik; Toulouse, Catherine (2014): 3D-Scans für die Rekontextualisierung antiker Skulptur. In: Staatliche Museen zu Berlin und Fraunhofer-Institut für Graphische Datenverarbeitung (Hg.): EVA Berlin 2014. Elektronische Medien & Kunst, Kultur, Historie ; Konferenzband ; 21. Berliner Veranstaltung der Internationalen EVA-Serie Electronic Media and Visual Arts ; 5. – 7. November 2014, Kunstgewerbemuseum am Kulturforum Potsdamer Platz, Berlin. Darmstadt: Fraunhofer-Inst. für Graph. Datenverarbeitung, S. 135–142.
- Lengyel, Dominik; Toulouse, Catherine (2016): Die digitale Visualisierung von Architektur. In: Deutscher Verband für Archäologie (Hg.): Blickpunkt Archäologie, 2/2016. München, Stuttgart, Darmstadt: Pfeil; Theiss; Wiss. Buchges (ISSN 2364–4796), S. 91–98.
- Lengyel, Dominik; Toulouse, Catherine (2017): Die Echtersche Idealkirche. Eine interaktive Annäherung. In: Damian Dombrowski, Markus Josef Maier und Fabian Müller (Hg.): Julius Echter. Patron der Künste: Konturen eines Fürsten und Bischofs der Renaissance. Berlin: Deutscher Kunstverlag, S. 127–129.
- Lengyel, Dominik; Toulouse, Catherine (2017): Interaktive Virtual Reality zum begreifenden Verstehen eines architektonischen Konzepts. In: Staatliche Museen zu Berlin (Hg.): Eva Berlin 2017. Elektronische Medien & Kunst, Kultur und Historie : 24. Berliner Veranstaltung der internationalen EVA-Serie : Electronic Media and Visual Arts : Konferenzband, 8. – 10. November 2017, Kunstgewerbemuseum am Kulturforum Potsdamer Platz, Berlin. Berlin: Staatliche Museen zu Berlin – Preussischer Kulturbesitz, S. 104–113.
- Schock-Werner, Barbara; Lengyel, Dominik; Toulouse, Catherine (2011): Die Bauphasen des Kölner Domes und seiner Vorgängerbauten. Cologne Cathedral and preceding buildings. 1. Aufl. Köln: Verlag Kölner Dom. ISBN: 978-3922442684

Доминик Ленгиел
Катерин Тулуз

НАДАХЊУЈУЋЕ ТУМАЧЕЊЕ АРХЕОЛОШКИХ ХИПОТЕЗА АРХИТЕКТОНСКОМ АПСТРАКЦИЈОМ

Резиме: Архитектура је архетип синтезе уметности и науке. Архитектура ствара просторе, археологија хипотезе о изгубљеној стварности. Од еволуције дигитализације, ове две дисциплине су се концентрисале на различите теме. Архитектура се фокусира на формални дизајн, а археологија на регистровање и тумачење. Архитектура и археологија се у већини поклапају у коришћењу фотореалистичних слика развијених уз помоћ рачунарског дизајна и апликација за њихово представљање. Замишљени пројекти и хипотетичке претпоставке обећавају више него што је реално могуће. Али, осим у архитектури где би понуђене фотореалистичке визуелизације могле да се поклапају са каснијом реализацијом, у археологији су фотореалистичке визуелизације увек далеко од свог научног садржаја. Због тога смо развили метод визуелизације археолошких хипотеза које се тичу изгубљене архитектуре. Поново смо успоставили традиционалне методе апстрактног моделирања и архитектонске фотографије, комбинацију која се ослања на традиционалне методе перцепције, историјских модела од глине и савременог фотографског компоновања, како би пронашли традиционалну перцепцију архитектуре. Визуелизација несигурног знања помоћу апстрактне геометрије исто тако изазива саморефлексију код гледаоца. Наука постаје очигледна, такође, наука постаје уметничко дело, једноставно зато што вербалну хипотезу мора учинити видљивом архитекта упознат са дизајнирањем геометрије која провоцира идеје о архитектури. Циљ презентације је да илуструје ову методу пројектима које су аутори развили у сарадњи са археолошким истраживачким институцијама попут Келнске катедрале и њених претходника, Палатинских палата у Риму и Идеалне цркве Јулија Ехтера.

Кључне речи: архитектура, визуелизација, несигурност, хипотезе, виртуелна фотографија, културно наслеђе