

REFLECTIVE VIRTUAL SPACE DESIGN WORKSHOPS

M. Juvancic, T. Zupancic

University of Ljubljana, Faculty of Architecture, Slovenia

Abstract

The intensive programmes such as virtual space design workshops offer an opportunity to introduce fast changing and developing fields into the experience of architectural students regardless of the flexibility level of curricular structures and institutional contexts. The main aim is to enhance and promote reflective place-sensitive interventions in physical and virtual worlds. The paper concludes with a discussion of intentions, experience gained, some sobering moments as well as the learning curves of participants and organizers when it comes to design culmination of sensitive physical and virtual realities.

Keywords: virtual space design, intensive programmes, learning model, sensitive places

МАСТЕРСКАЯ РЕФЛЕКТИВНОГО ДИЗАЙНА ВИРТУАЛЬНОГО ПРОСТРАНСТВА

М. Юванчич, Т. Зупанчич

Университет Любляны, Факультет архитектуры, Словения

Аннотация

Такие интенсивные программы обучения, как «Мастерская рефлексивного проектирования виртуального пространства», предоставляют благоприятную возможность введения в подготовку студентов-архитекторов быстро меняющихся и развивающихся разделов знания вне зависимости от уровня гибкости и принятого содержания учебных планов. Основная цель работы – усилить и продвигать рефлексивные, связанные с областью ощущений интервенции в физический и виртуальный миры. Статья заканчивается обсуждением целей, достигаемых обучением, а также путей обучения и относящихся к ним некоторым разумным аспектам применительно к участникам и организаторам учебного процесса, когда сам процесс доходит до кульминации ощущения физической и виртуальной реальностей.

Ключевые слова: дизайн виртуального пространства, интенсивные программы, модель познания, области ощущений

Introduction

The EU LLP Erasmus framework and its intensive programmes (IP) offer new solutions for universities with rigid architectural curricula and changing learning conditions. Instead of introducing new courses, new adapting learning models can help to introduce otherwise elusive cutting edge and fast changing fields (Smith, Hedley and Molloy, 2009). IPs last for at least 10 days and can be part of a thematic series.

The IP entitled “Designing and Inhabiting Virtual Environments” (DIVE) represents one of the follow-up projects of the VIPA e-learning project (Mullins et al, 2006) that establishes a virtual platform and an embryonic curricula for the students of virtual space design. The experience and knowledge gained during the VIPA project, along with the assessment of the possibilities of future joint programmes (Zupancic, Mullins & Juvancic, 2006) show the need for a transition period and for various means to introduce the topics to students, especially within rigid curricula structures. The DIVE uses and enhances the established partnerships, the VIPA learning platform, some of other tools and, in general, it addresses the VIPA topics and focuses on some specific issues.

The DIVE IP attempts to bring an insight into the emerging and fast changing field of virtual space design and its possibility to be merged with more “physical”, traditional but urgent topic of preservation of especially sensitive places. Following the thread of virtual space design (Grasl, Falkner and Kühn, 2006) and design in sensitive places (Wortham, 2005), the DIVE series starts from the topic of (i) “Skipping dimensions”, continues to (ii) “Humanization of virtual environments” and finishes with the omnipresent “DIVE” theme of (iii) “Respecting fragile places”. What a fragile place and a sensitive design intervention are – remains the prevailing question of the DIVE series. Is the intervention sensibility related to spatial fragility? If yes: a) how to develop physical and virtual laboratories for sensitive interventions? b) how to promote such interventions? c) what is the future of the most fragile physical and virtual environments and how do they relate to each other?

The starting points of all the three IP-s can be found in the physical-cultural environment. Thus the course contents is deeply ingrained into the existing “traditional” architectural curricula of the majority of project partners and is intensively concerned with the physical architectural reality. The first, already finished IP 2008, focuses on the levels of abstraction in the process of its spatial interpretation, design intervention and the notion of scale. The second IP, the DIVE 2009, redirects the DIVE-story to the notion of the user in relation to physical and virtual environments: to humanization of virtual environments. It builds on the notion that the user of physical and virtual environments is the same. What are the levels of humanization in physical and virtual environments? How do they relate to each other?

The paper first establishes the basic terms and IP evaluation criteria. From the first IP results the levels of abstraction/concretization, the levels of sensitivity of places and the levels regarding the sensitivity of interventions are defined. All the parameters are summarized in a table, illuminating the learning/design process. The learning model for physical-virtual space sensitive places is suggested.

Between physical and virtual, concrete and abstract

As architects we are very familiar with physical spatial contexts and interventions in physical realities. On the other hand, we know many successful stories of solely virtual environments and their spatial developments that have not been embraced only by professionals but also and even more so by wider, general public (i.e. Second Life). However, it is the overlapping of physical and virtual spaces that interests us the most in the DIVE context. Each part in the series of IPs starts with a physical reference site, having specific historic, cultural, morphological, architectural sediments providing participants with broader, in-depth spectre of context (often absent or underdeveloped in virtual environments), also as a metaphorical pool for design ideas, anchoring them in socio-spatial aspects of the given places.

For the simplicity of the division of two environments and interventions into physical and virtual we don't intend to look at the levels of immersion or means of achieving the immersion but we rather divide them according to the end-user and the envisioned end-use. The following criteria offer some more depth for evaluating design interventions, be it virtual or physical in especially sensitive or fragile places.

Level of abstraction/concretization of space/place and interventions

Leaving presentation techniques out of the equation and observing only the levels of concretization/abstraction of places and their contextuality, we can establish that places are usually abstracted to different levels in the design process. The architects tend to summarize, abstract and "model" the surroundings of introduced intervention in a way that helps grasping the physical and cultural aspects in their simplified causal relationships. The abstraction can be defined as a two way process: with the reduction of the details and the summarization of similar aspects into their new and fewer simplified, often exaggerated versions. It is not always the case that virtual environments are more abstract than real physical counterparts.

One end of the abstraction/concretization is a concrete representation of physical space with plenty of details and phenomena modelled in, the other end represents the abstract model which borders the "recognition line" of the place. The recognition line could be defined in comparison to the "image" of the place the user has in mind: does the user/evaluator still recognize the connection between the modelled and "physical" space? A similar criterion represents the abstraction/concretization of interventions.

Physical vs. virtual tectonics

Zupancic and Mullins (2007) established that in virtual learning environments different kind of tectonics (from Framptonian definition) are applied. While physical tectonics is bound to physical forces and structural nature of buildings, the virtual tectonics originally knows no gravity, climate or materiality but is bound to data flux, technological constraints, laws of programming, etc.

Scalability

The relation to scale is another aspect that can distinguish the physical and virtual environments, especially the interventions in them. The scalability of place in physical world is almost nonapplicable, while the same cannot be said for virtual environments. The interventions in real worlds are scalable to a degree; a chair can be scaled to a building size to form a sculpture (attracting attention of the observers and providing meaning solely through the use of unusual scale), but the tectonics does not sit well with proportional scalability in physical world (a model of a plane cannot be scaled up and still fly, it needs a redesign).

Out of proportion rarely applies in virtual environments. Through student works in design studios we have proved that crossing of scales can be done (Zupancic and Mullins, 2007) i.e. vertical city is transposed into an interesting miniature packaging for mobile phones. It is the denial of the notion of scale and easy transitions between different scales that distinguish virtual environments from physical. Scalability is fraught with danger when used without the critical distance or reference but it can enhance the user's ability of cross scale thinking, too.

Levels of humanization

Level of humanization is defined as the potential (of identity) of virtual space to be identified with physical space and vice versa. Imagining the physical environments without humans is almost impossible. Their absence is always as meaningful as their numerous presences. The virtual environments are not as unimaginable without users' representations. Barren, wide or very abstract places are not imbedded in our minds, thus some level of humanization is needed to bridge the gap from abstract Euclidean world of geometry into something that we can call a

place or site. The users have to relate to something in the place: either the scale, the transmitted identity (evoking memories, feelings, familiarity with some experiences), the dynamics (living, movement, growth) or life of some sort (the fellow human, avatar, creatures, etc) – human in this case means close to complex human experience and perception of the world. The environment without any of the humanizing aspects achieves low level of humanization, while the opposite side features all of the above mentioned aspects of humanization. While making theoretical assumptions at the time of the writing, the DIVE 09 will try to define humanization of physical and virtual places through experiments in physical and virtual environments.

Sensitivity of places

The places the architects want to intervene in have different sensitivity levels. There are only few insensitive physical places left on Earth, because the scope of sensitivity not only includes sensitiveness to socio-cultural but also to natural aspects of environments. The place is seen as sensitive or fragile because of its sensitive ecosystem that interventions might disrupt or have negative influences on or because of its “socio-system”: layers of historical, cultural, social sediments and relationships which can be gravely influenced or destroyed with new interventions. The most fragile physical places are usually but not necessarily protected by legislation and strict building codes; these cases are automatically defined as fragile. Through the sensitivity (and below defined “disruptability”) of eco-system and socio-system other legally less protected spaces can be categorized in terms of sensitivity.

In virtual environments that exist and are used strictly as such the sensitivity is much less obvious. Some places in such environments (i.e. Second life) are showing the characteristics of fragile places, especially in the “socio-system” part, while others are more robust in terms of sensitivity. The category of place/site sensitivity is inseparably connected to interventions because the indicator is the disruption the intervention might cause in the site/place. The place which can easily be disrupted and drastically changes its character can be regarded as sensitive/fragile.

Sensitivity of interventions

The response to places/sites one intervenes in can be evaluated on the scale of sensibility as well. The most sensitive interventions take most of the socio-cultural and natural aspects, starting point and relationships into account, act within their boundaries or respectfully upgrade them not trying to oppose. The most insensitive intervention starts from the opposite end, regardless of contextuality of the site and its inner relationships, trying to either deny the existing rules and establish new ones in given environment or act as an autonomous whole, more or less ignoring the context. The evaluation again is relative and can be monitored only on the case to case or better “place to place” basis. An example of acting within given “place rules” as a measure, is the scale factor: acting within the scale of the site is regarded as sensitive, establishing new scale or crossing the existing scale is considered insensitive. Usually, having the physical space in front of us, the sensitivity of interventions is easily determined but evaluating the virtual interventions in virtual environments is not as obvious. Nonetheless, the observing of place/site and environment rules can still apply but it is, similar to tectonics, bound to other kinds of rules.

The DIVE process and the case studies

The site of Krakovo in central part of Ljubljana (Slovenia) has been chosen as an example of a particularly fragile and sensitive place. It has a specific, village like scale, specific plot division, morphological and typological building characteristics. It is formally (legislatively) recognized as sensitive and as such perceived also among the general public. The participants started working on site in four groups (up to 5 students), usually with two teachers that guided them and offered support. After seven intensive working days, developing concepts for proposals, the intermediate results were presented and participants regrouped into two larger groups. In the

remaining days they finished their projects and presented them to their colleagues, students and outside reviewers.

The case studies used in the paper numbering 1, 2, 3 and 4 are interventions suggested in DIVE 2008, the case study number 5 is referential design studio example, located in Gdansk, useful for making comparisons:

1. The group has been searching the means to “export” and present the fragile and sensitive place of Krakovo to other “neglected” parts of Ljubljana. They wanted to transfer the atmosphere and images of Krakovo (peace, tranquillity, village like scale, greenness, etc) to Plecnik’s passage. The proposal projects the images of physical place to the surfaces of alternative, satellite site. (Fig. 1)
2. Second proposal captures the sounds in Krakovo (sensors) and translates the input into graphic representation projected on the walls and floors of the passage. (Fig. 1)



Fig. 1. Case study 1 (bottom left) and 2 (bottom right) and the original site of Krakovo in Ljubljana (top left), “satellite site” Plecnik’s passage (top right) (authors: J.B. Sabra, P. Sommersguter, M. Resl, N. Dziadus, G. Zemva, T. Vilfan, S. Mitrovic), source: Zupancic and Juvancic, 2008

3. Searching the form leads through parametric design (NetLogo). The intervention has been modelled and worked upon with Rhinoceros and ParaCloud software, evolving into a proposal for new physical structure. (Fig. 2)

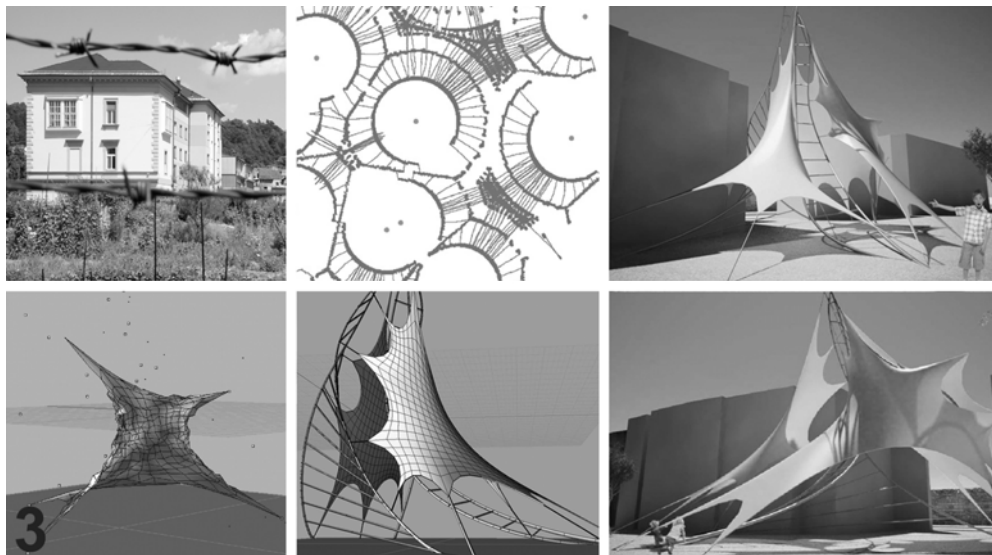


Fig. 2. Case study 3: micro location in Krakovo and the developing process (author: C. Raun, source: Zupancic and Juvancic, 2008)

4. Starting from physical space, the group translates the parameters into virtual environment, modelling them there and proposing the physical intervention in physical space. (Fig. 3)

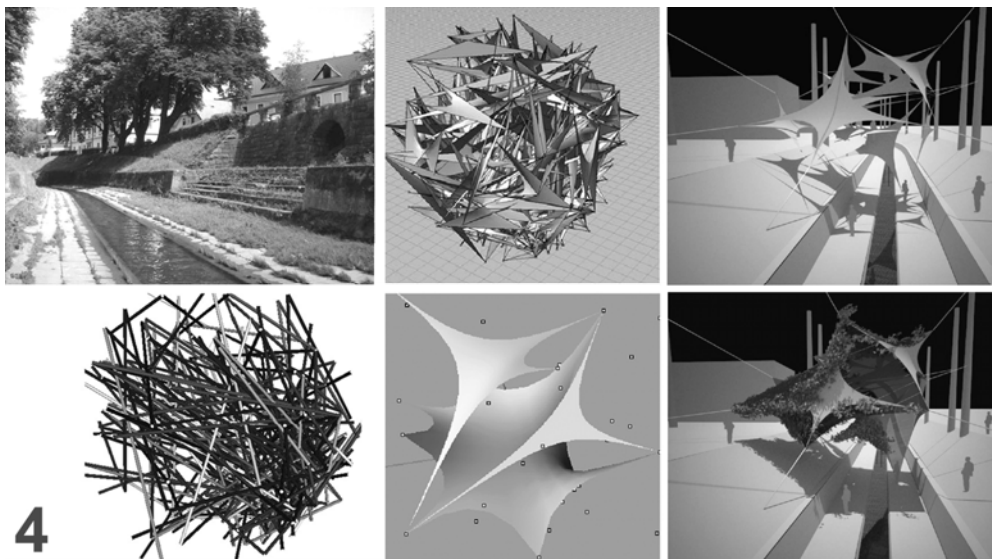


Fig. 3. Case study 4: microlocation (top left) and the developing process (author: J.T. Christensen, source: Zupancic and Juvancic, 2008)

5. A VIPA parallel design studio presents the comparable fragile space of Gdansk in virtual environment. The intervention translates referential artifacts and experience into the virtual environment, abstracting them, making them recognizable and projected into virtual space. The intervention also suggests a connection of an unused portal in Ljubljana's old town with the virtual environment of Gdansk, thus connecting two fragile places and presenting them to the public. The software used: Blender, Croquet. (Fig. 4)

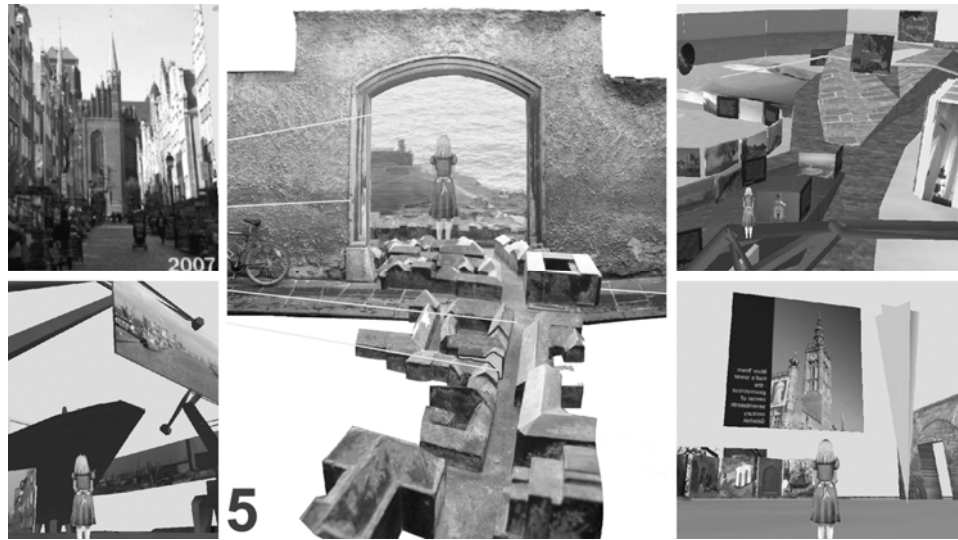


Fig. 4. Case study 5: Gdansk old town (top left) and the proposed intervention, “satellite” site: portal/porthole in Ljubljana (Kaufmann, 2007)

Results – evaluation

The results of the case studies’ evaluation according to the stated criteria are summarized in the Table 1.

Table 1. Evaluation of study cases according to different criteria

Case Study	Physical ↔ Virtual	Level of place abstraction (L-low, H-high)	Level of intervention abstraction	Tectonics (P-physical, V-virtual)	Scalability	Level of humanization	Sensitivity of place	Sensitivity of intervention
1	P□□□□V The projection can exist in both environments	L■■■■□□H Original site - Krakovo L■□□□□H ‘Satellite’ site - passage	L■■■■□□H Projection of physical on physical	P■□□□□V Ground is still ground, despite projection	L■■■■□□H The projection is scalable, but not without change of meaning	L■■■■□□H Projection presents an aspect of site familiar to people, easy to relate to, has scale, texture, etc	L■■■■□□H Original site – Krakovo L■□□□□H Satellite site - under-way passage	L■■■■□□H At original site – Krakovo: nothing materializes L■■■■□□H Satellite: materialization used only as disposition of projectors
2	P□□□□V	L■■■■□□H Original site - Krakovo L■□□□□H ‘Satellite’ site - passage	L■■■■□□H Projection of physical sounds transcribed into abstract motion, animation	P■□□□□V Marginally follows the physical tectonics, swarm like, but the projection is bound to physical constraints	L■■■■□□H The projection is scalable without changing the meaning	L■□□□□H The only aspect of humanization is the satellite site context not the intervention itself	L■■■■□□H Original site – Krakovo L■□□□□H Satellite site - under-way passage	L■■■■□□H At original site – Krakovo: nothing materializes L■□□□□H Satellite: materialization used only as disposition of projectors, the projection itself is less sensitive to given existing environment
3	P■□□□□V	L■■■■□□H Original site – Krakovo: represented only as geometry	L■■■■□□H Hinting sail like structure and supporting beams, associated with roofs	P■□□□□V Anchored to physical imagination, intended to stand on	L■■■■□□H The intervention is scalable across different levels	L■□□□□H The intervention is associated with human environments through its tectonics, hinting roof structure, familiar with our experience	L■■■■□□H Original site – Krakovo	L■□□□□H The proposed intervention breaks the rules of the place (morphology, typology, plot division, etc)
4	P■□□□□V	L■■■■□□H Original site – Krakovo: represented as geometry, hinting some natural elements but not passing the geometry level	L■■■■□□H Associating sail like structure suspended among trees, with greenery	P■□□□□V Anchored to physical imagination; suspended – it is not as bound to physical as the case no. 2	L■■■■□□H The intervention is scalable across different levels, provided we take columns as poles and not as trees	L■□□□□H The intervention is associated with human environments, hinting sail structure, greenery, familiar with our experience	L■■■■□□H Original site – Krakovo	L■■■■□□H The intervention breaks the rules of the place (see above), but also subtly enhances the place; distances itself from the surroundings - suspension above ground & river
5	P□□□□V intended for virtual use	L■■■■□□H Material and experiential references, historic layers, etc	L■■■■□□H The intervention as juxtaposition of elements that can be understood as concrete, but their juxtaposition and presentation is abstract	P■□□□□V Anchored mostly to physical imagination, but the suspension without support hints other tectonics; the use of teleporting and other means of moving in	L■■■■□□H The projection is scalable, but not without the change of meaning; unless the scale of avatar changes as well, then it is scalable to infinity	L■■■■□□H The place reflects and summarizes the physical experiences of selected site providing material, visual, soci-spatial reference	L■■■■□□H Original site – Gdansk: old part of town L■□□□□H Virtual site: less sensitive to changes L■■■■□□H Satellite site – Ljubljana, physical portal in an old part of town	L■■■■□□H Original site – Gdansk: nothing materializes L■■■■□□H Virtual site: acts in accordance with given environment and uses its rules to its advantage L■■■■□□H Satellite site: reinterprets the portal as porthole, connects two fragile places

Discussion

The table mostly speaks for itself but some of the findings must be highlighted. The first two and the last case studies (1, 2 & 5) recognized the sensitivity of the place and adjusted their interventions accordingly: either intervening somewhere else – at the satellite site or crossing into virtual environment. The tectonics generally follows physical constraints (also in virtual environments) and the scalability is a characteristic for most of them. We can see that the abstraction level is not connected with the sensitivity levels. The humanization of interventions is not easy to achieve, especially in cases with higher level of place abstraction.

While the DIVE project tried to address the cross section of physical and virtual, the students still felt the need to materialize their designs, thus some of models were 3D printed. The interventions were never meant to function solely in virtual environments despite encouragements. On the other hand, the virtual Gdansk experience “materialized” in virtual environment and functions in that environment – rare example of “switching over” (and staying there). The physical – virtual cross section remains elusive!

Conclusion

The comparison of the aims and the results of the workshop shows that several aims were achieved (exploring scalability, sensitivity) but not all (i.e. reflections of real in virtual, reflections of virtual in physical environments and their connections). The results of the conceptual phase were often more concrete than the final proposals and results. The connections between physical and virtual environments were not explored to the extent envisioned – there is much room for experimenting at this borderline. The balance of virtual against physical interventions has (in DIVE 2008) leaned intensively towards thinking about physical world interventions – it would be interesting to reach the balance or tip it to the other side.

It is with hindsight and evaluation of cases through above defined criteria that we can say the process of creating, experimenting, and using the tools, discussion was more important than the proposals themselves (observed through the levels of sensitivity of intervention in fragile places – some of them not respectful and sensitive at all). The overlap can be much better utilized and elaborated than the design studio case 5 shows.

The DIVE intensive programme offers an opportunity to introduce new topic into the curriculum without demanding dramatic changes and approvals. The international setting brought fresh perspectives, wider knowledge and skill base to the equation. The same knowledge base proved to be also the hindrance as the younger, less skilful students had great difficulty following the skills of students familiar with digital design tools. As expected, the skills and sensitivity of students cannot be equated, yet a more sobering instance is the comparison of digital design skills and search for the overlapping of virtual and physical environments – here again the most skilled designers still tried to materialize their creations, wanting to touch and feel them – strongly favouring the physical aspect. So the question remains: do we really live in two worlds or just fondly imagine that we do so?

References (Литература)

1. Grasl, T., Falkner, C. and Kühn, C.: 2006, Easy access classes for three-dimensional generative design - Using a collaborative environment for e-learning, in Bourdakos, V. and Charitos, D. (eds), Communicating space(s) : proceedings of the 24th Conference on Education in Computer Aided Design in Europe, University of Thessaly, Volos, pp. 884-889.
2. Kaufmann, M.: 2007, Ljubljana Gaps / Gregorciceva / Filling the gap / Virtual Space (design studio 5; mentor: T. Zupancic), University of Ljubljana, Faculty of Architecture, Ljubljana.

3. Mullins, M., Zupancic, T., Kühn, C., Coates, P. and Kipcak, O.: 2006, VIPA: A virtual campus for virtual space design, in Bourdakis, V. and Charitos, D. (eds), Communicating space(s) : proceedings of the 24th Conference on Education in Computer Aided Design in Europe, University of Thessaly, Volos, pp.464-469
4. Smith, D., Hedley, P. and Molloy, M.: 2009, Design learning: a reflective model, Design Studies, 30(1), pp. 13-37.
5. Wortham, B. D.: 2005, Cultural Sustainability and Architecture, in Riewe, R. (ed), GAM.02 Design Science in Architecture 2005. Springer Verlag, Wien, pp. 62-77.
6. Zupancic, T. and Juvancic, M. (eds): 2008, DIVE 2008: Designing and Inhabiting Virtual Environments - Skipping dimensions in Ljubljana, Erasmus Intensive Programme; University of Ljubljana, Faculty of Architecture, Ljubljana, Slovenija (organizer and leading partner), University of Aalborg, Technical University of Vienna, University of East London (all: partners); 29.6.-9.7.2008; <http://vipa3.adm.at/course/view.php?id=32>
7. Zupancic, T and Mullins, M.: 2007, Reconfiguring Course Design in Virtual Learning Environments, in Kieferle, J.B. and Ehlers, K. (eds), Predicting the Future, 25th eCAADe Conference Proceedings, FH Wiesbaden and FH Frankfurt, Frankfurt am Main, pp. 647-654.
8. Zupancic, T., Mullins, M. and Juvancic, M.: 2006, Joint curriculum developments in the field of virtual space design, in Bourdakis, V. and Charitos, D. (eds), Communicating space(s) : proceedings of the 24th Conference on Education in Computer Aided Design in Europe, University of Thessaly, Volos, pp. 502-505.

DATA ABOUT THE AUTHORS (ДАННЫЕ ОБ АВТОРАХ)

Matevz Juvancic

Asist. dr., Faculty of Architecture, University of Ljubljana, Slovenia

e-mail: matevz.juvancic@fa.uni-lj.si

Tadeja Zupancic

Prof.dr., Vice-Dean for Research, Faculty of Architecture, University of Ljubljana, Slovenia

e-mail: tadeja.zupancic@fa.uni-lj.si