2016 DESIGN COMMUNICATION EUROPEAN CONFERENCE PROCEEDINGS

FACULTY OF ARCHITECTURE AND DESIGN | ÖZYEĞİN UNIVERSITY

ISTANBUL, TURKEY | MAY 11-14, 2016

INCLUSIVENESS IN DESIGN

EDITORS

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2016 Design Communication European Conference
{ Inclusiveness in Design }

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Host School | Özyeğin University

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Chapter 04 | Session D2

Multi-Media Guidelines for Instructing Urban Design Contests

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Keywords: experiential simulation; dynamic and interactive representation; urban design contest

Abstract
The investigation of novel modalities and procedures to construct and make use of guidelines for urban design contests on the basis of perceptual representation principles is presented in this paper as a result of our research experience and the applications carried out over time. The paper firstly addresses a theoretical framework that highlights the importance of including representation values and tools in design contests; the second part illustrates applications of design guidelines to real case studies, such as design contests and workshops. Findings show that implementing additional information based on perceptual values is feasible, can enrich the knowledge about the design site and lead to more informed design solutions, thus indirectly increasing the overall quality of schemes.

Introduction: theoretical framework

Today, most of the design contest guidelines are based on few types of documentation: a written brief, static representation and photographic material. This common way of presenting a design area is not sufficient in order to give back the complexity of a project site (Bosselmann & Gilson, 1993). For instance, the forms of representation used in briefs are generally static: both pictures and abstract architectural drawings (horizontal and vertical sections) do not enable a deep dynamic interaction with the viewer, and the spatial understanding of the place is solely based on the envisioning skills of trained designers. Moreover, most of the times, site visits are organized during the contest and this helps to clarify and get a full understanding of the place and its atmosphere. We argue that this procedure is not enough, even if the designer has a long experience. Not all the participants to contests have the chance to attend physical visits of the place and in any case these field trips generally represent sporadic occasions. Our work refers to the 'augmentation' of design briefs with additional sensory - mainly visual - information, in order to bring places into the office. In fact, we want to stress the aspect of the missing experience that characterizes traditional design briefs. In order to reduce the gap to the experience in place and support design thinking, we worked on novel design briefs based on the following concepts: interactivity, that includes dynamicity, immersivity, and multi-sensoriality (Piga & Morello, 2015). In particular, we argue that interactive maps and models, dynamic images and immersive panoramas and simulations add value in terms of proper communication and support to design thinking, at least from the visual point of view. In particular, we believe that simulations with different levels and types of interaction represent useful tools ranging from the design thinking to the design presentation phases. Moreover, experiential simulation becomes really relevant in case we want to include a variety of actors, professionals and non; in fact, these types of media enable to narrow the gap between technicians and lay people, thanks to the immediateness of communication and easiness of understanding provided by the realistic approach. Finally, this reduces at the minimum the effort to interpret technical drawings that can result quite difficult for lay people, enabling at the same time to put the viewer into the scene, thus supporting the sense of engagement.

Interactivity, Dynamicity, Immersivity

Interactivity can be considered as the the wider system that includes *dynamicity*, while interactivity and dynamicity together can encompass *immersivity*, in a sort of matrioska system (Fig 1). In fact, interactivity is strictly connected to *direct interplay* (interactivity), that is tools or media that enable a live action/reaction with the final user/s; generally speaking, a solution that allows to perceive the *sense of motion* (dynamicity) is interactive per se, and the same can be said for the *sense of presence* (immersivity), where at least the user can look around (Piga, 2010; Piga & Morello 2015).

According to the communication and simulation tools in place, it is possible to identify different kinds or levels of possible interactivity; for instance, some solutions enable to switch on/off the layers and to compare different elements on the same base, some others allow to look around and to virtually move through a virtual environment. In order to categorize these different modalities, it is possible to conceptually identify two main ways of interactivity: *indirect* and *direct*; the first one can be *mediated* only, whether the second one can be *mediated* or *free*, as shown in the scheme below (Fig 2) (Piga, 2010). Hence, we can define *indirect interactivity* the simulation that makes use of a moderator to present the content; for instance, when the architect presents the project and the simulations to the audience; the active role of the architect has an important impact on the communication process, that of course, affects the evaluation phase (Appleyard, 1977). The *direct interactivity* is instead related to simulations that can be used without a moderator. In this second case, it is possible to interact with the simulation through a recognizable interface, such as the keyboard and the monitor, and in this way we are within the *direct and mediated interaction*; instead, when the interface is not recognizable during the experience, e.g. using Head Mounted Displays (HMD) that enable to freely look around, we are in the domain of the *direct and free interaction*. In the first case, the tool allows for a *non naturalistic interaction*, while in the second one we experience a *naturalistic interaction*, where the natural man/environment action/reaction is realistic; this last way of dealing with simulated environments is crucial for a proper experiential understanding, since "looking around and moving about are fundamental dimensions of a person's visual experience in landscape" (Danahy, 2001). This kind of interplay assures the maximum level of engagement, since it provides a (virtual) sense of presence in the simulated environment; this feeling of being in the place, that enhances the spatial knowledge, is even reinforced when the user can move around in the virtual environment (Lathrop & Kaiser, 2002; Lange, 2005).

Of course, the use of the correct level of *dynamicity and immersivity* of simulations is crucial to deliver an effective and proper information to the user (i.e. the citizen or the professional) regarding urban transformations; these media should be trustable and accurate in order to minimize the possible misunderstanding and the consequent misinterpretation and evaluation process (Appleyard, 1976; Sheppard, 1989; Bosselmann, 1998; Piga, 2010; Piga & Morello 2015).

Fig 1. The relationship intervening between interactivity, dynamicity and immersivity

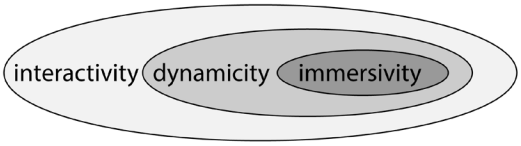
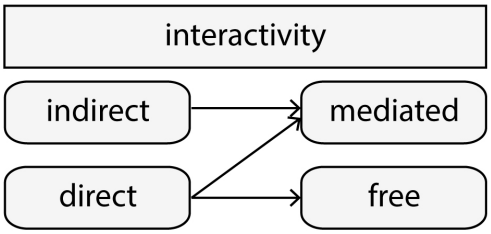


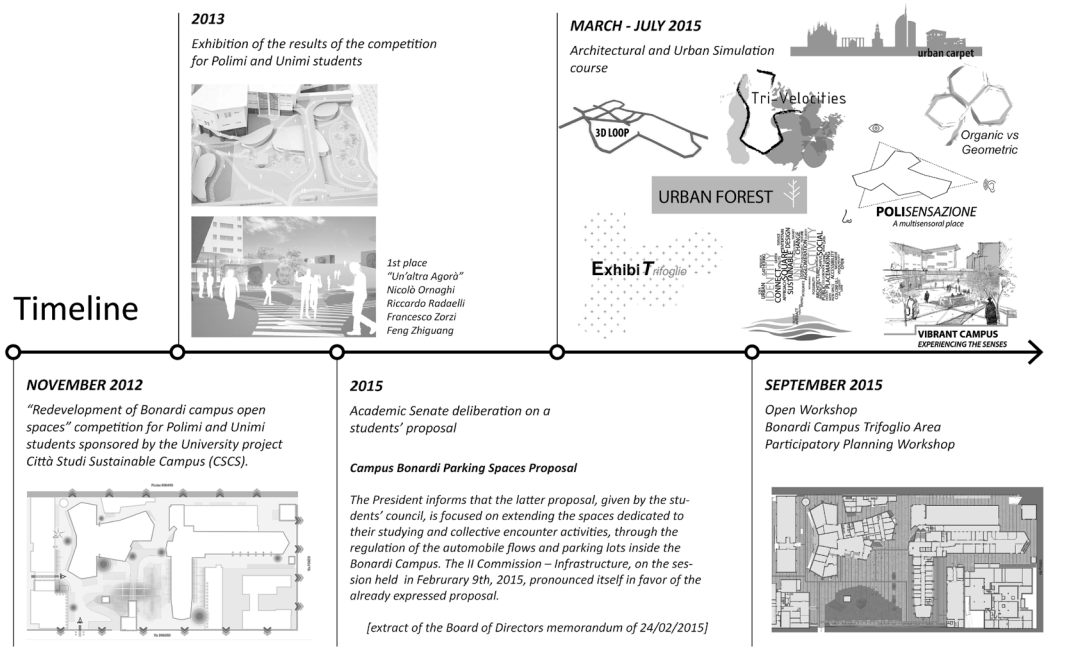
Fig 2. Defining interactivity modalities to simulation



Applications of visual content to design contests

In this second part we introduce some applications of visual content added to design contests and used to increase the transferring of information to the final user (typically the designer as receiver of the guidelines). We specifically refer to a long design process that was launched as part of a co-design activity within the university project on the topic of envisioning a sustainable campus[1]. In particular, the co-design process started in 2012 aimed at redesigning and giving back to students a neglected open space on campus. This should happen with a strong involvement of students (a redesign project "for students and by

Fig 3. The timeline showing the co-design process whereby students have been involved in the redevelopment of a neglected open space on campus



students"). Figure 3 illustrates the timeline of this three years long process, which encompasses several types of design activities. Hence, depending on the activity, different kinds of visual representation and simulation have been proposed to inform the final users of the guidelines, like spherical pictures, spherical pictures augmented with textual information (e.g. design tips), augmented digital models, augmented physical models.

The design competition

In the fall 2012 we were in charge of setting up the guidelines of a design contest for students aiming to redevelop an open space, the Bonardi Campus, as a relevant public area inside our university campus[2]. We developed the brief together with, the cartographic and photographic materials (see Piga & Morello, 2013) with a specific goal in mind: to use different forms of representation in order to stress a design approach based on human experience. To do that we developed several materials based on an experiential and environmental approach to the place (Fig 4); in fact, the proposed design guidelines made use of perceptual representations in addition to the traditional ones;

Fig 4. Additional visual content delivered as part of the design guidelines for a design contest: (a) the sensory map of the design site; (b) the navigable spherical image with annotated design topics and tips; (c) the fixed cameras on the 3-D model from which participants had to provide renderings of the design schemes.

for instance, we developed three types of additional materials. Firstly, a sensory map with the environmental topics of the place was produced in order to make the participant aware of experiential aspects (Fig 4a). Secondly, we included spherical panoramic images as part of the brief linked to the strategic plan (Fig 4b). This content was meant to be navigable pictures with annotated text directly superimposed to the image, hence highlighting specific themes directly on the points of interest; in particular, we introduced colors to assign the design tip to specific themes, namely: people, energy, environment and mobility. Thirdly, we delivered a 3-D model of the area with a number of fixed cameras at relevant eye-views, to underline the importance of the the walker experience in the open space on campus (Fig 4c). We asked participants to produce simulations from these same locations and targets; in doing this, it was possible to collect comparable representations of the submitted design solutions. At that time, we assumed that not only the jury could benefit from this work on simulation, but also the designers; in fact, requiring perceptual views fostered participants to take into account significant points of view.

The guidelines developed during the teaching experience

Unfortunately, the redevelopment process had a stop after the competition. The winning design schemes

Fig 5. The analysis of the Bonardi Campus according to students' observations and interpretations

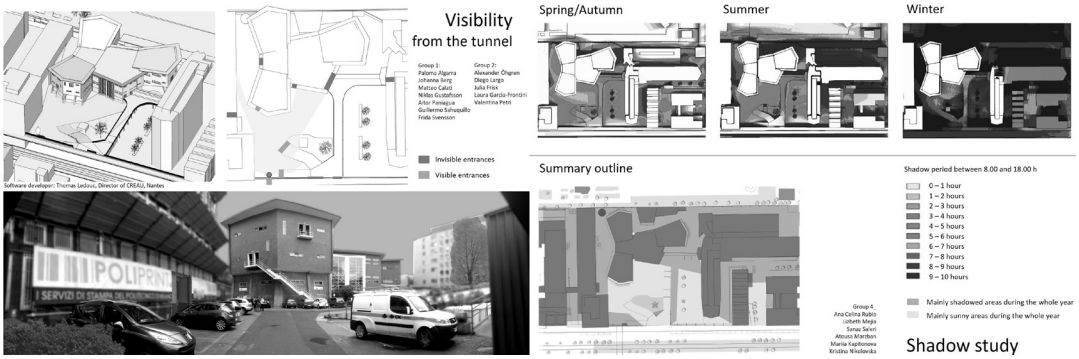
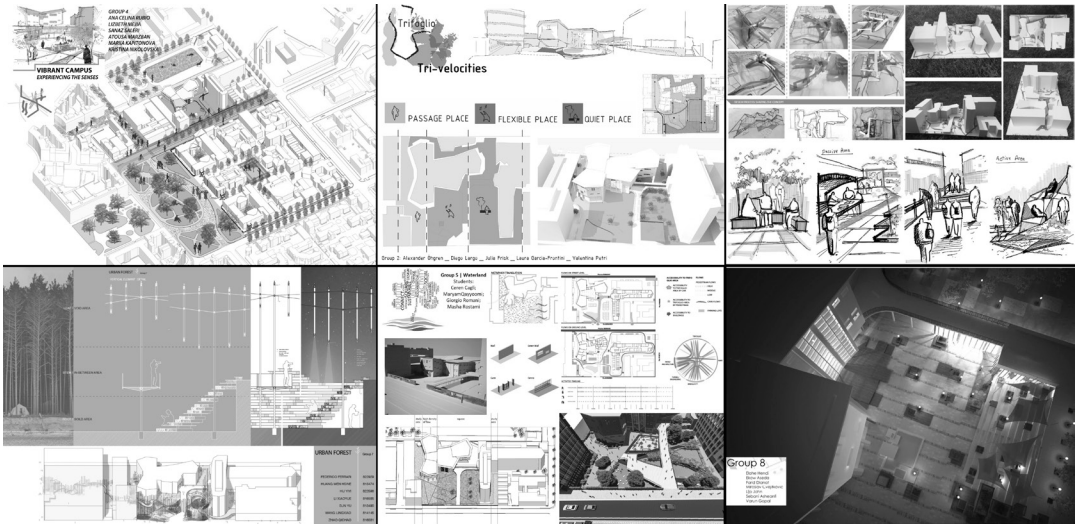


Fig 6. Different forms of representation developed by the students of the Architectural and Urban Simulation course (Spring semester of 2015) used to develop design guidelines and meta-design solutions



have been published online, presented to the public through a small exhibition in 2013 and finally submitted to the technical offices. Of course, the emerging ideas were more ambitious than the allocated budget for the reconstruction, but the purpose was to give fresh inspiration to the technical offices. Afterwards, at the beginning of 2015 the process entered a new phase thanks to the commitment of the Academic Senate that voted in favour of a design solution to be implemented by students. Students from the School of Architecture and Urban Planning have been engaged through the course of named 'Architectural and Urban Simulation' that dedicated the design activities to develop guidelines and meta-design projects on the Bonardi campus. The students were asked to work with a multisensory environmental design approach. To do that, they used different simulation software, in order to support the design thinking phase, to test design outcomes, and to validate the cumulative outcomes of the final design project. Of course, managing the transformation in its dynamics, i.e. space and time, required to work in parallel to conceptual representation of the environment and experiential simulation (McKechnie, 1977). For this reason students used several forms of representation, both analog and digital ones (see Fig 5 and Fig 6), according to the design phase for studying and designing the layout of the place in relation to the dynamic experience of people in the place (Piga & Morello, 2015).

The open design workshop[3]

Starting from the solutions presented at the first competition and from the design guidelines prepared by the students of the class on Architectural and Urban Simulation (Spring semester of 2015), the collected knowledge and data on the Bonardi Campus was mature enough to lead to the the final proposal. The technical office asked to reduce the budget for construction and to provide a cheaper solution as opposed to the design schemes produced by students. Hence, we delivered the final design guidelines and hold the final design workshop with students in September 2015. The one week long workshop was a further occasion to study the usefulness of the experiential approach and of interactive simulations for urban design competitions.

Fig 7. The 3-D digital model with the superimposed interface with interactive guidelines

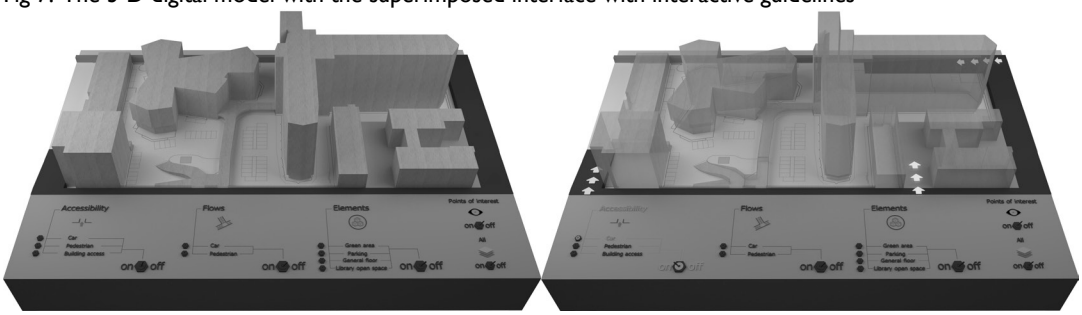
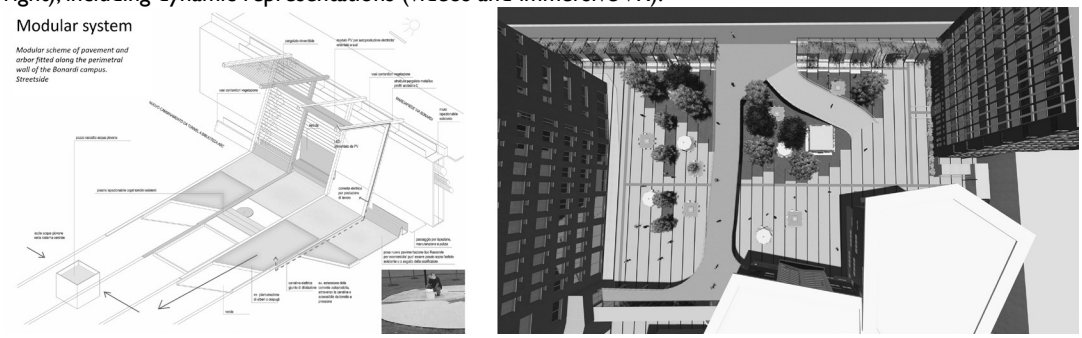


Fig 8. The outcomes of the design scheme used technical drawings (on the left) and visual simulation (on the right), including dynamic representations (videos and immersive VR).



Specifically, in order to communicate the design strategy we worked on a new form of representation based on guidelines superimposed on 3-D models thanks to a dedicated interactive interface (Fig 7), where spherical panoramas and videos are linked. In particular, the model stresses the spatial dimension of the guidelines, photographs enhance important points of view, while videos focus on the dynamic walking dimension. In short, beside horizontal and vertical sections, we proposed other forms of visual representation able to depict relevant information in a direct and intuitive way.

Finally, the outcome of the process is a preliminary design project developed through technical drawings and immersive simulations (video renderings) used to test the proposal and not only for presentation purposes (see Fig 8). The project is in the public domain and available online[4].

Conclusions

Through the case study application, the paper referred to the theoretical framework investigated over the years by our research laboratory, which led to specific research products aiming at increasing the visual and experiential aspects in design. In particular, the theoretical framework organized the simulation media in conceptual and perceptual categories, attributing to each one a specific communication ability for describing and recalling environmental characteristics. Results of the study show that representational modalities have a great influence on design thinking, and that today technologies can support architects and planners to better govern the temporal and cumulative outcomes of design processes, thus leading to an overall improvement of quality in our built environment.

Acknowledgments

All this work was possible thanks to the support of the university project 'Città Studi Campus Sostenibile' which provided the necessary funding and the strong commitment to conduct the co-design process presented in the paper. We are highly indebted to the numerous students who generously and passionately contributed to the construction of this very long process and directly worked in the achievement of the outcomes of this project. In particular, we have to thank many students. In chronological order: firstly, the students that participated to the design competition in 2012; then the students attending the Architectural and Urban Simulation course in the Spring semester of 2015; finally, the students participating to the open design workshop in September 2015 on a voluntary basis. Finally, we would like to express our gratitude to the operations offices of our institution, in particular all the staff of the technical and construction area and the sustainability office for the time dedicated to us.

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Notes

1. 'Città Studi Campus Sostenibile' is the title of the larger inter-universities initiative ongoing at the university district in Milano (www.campus-sostenibile.polimi.it).

2. For the contest brief please visit the following address: www.campus-sostenibile.polimi.it/web/guest/bando

3. Flyer of the workshop at: https://goo.gl/photos/dcVKzri7CnG83BRQ9

4. Video content with the outcomes of the workshop can be found on Youtube: a slideshow presentation of the process (https://youtu.be/3Kc8ZW1RCxc) and the video of the design scheme solution (https://youtu.be/4eTfWkydQyc)