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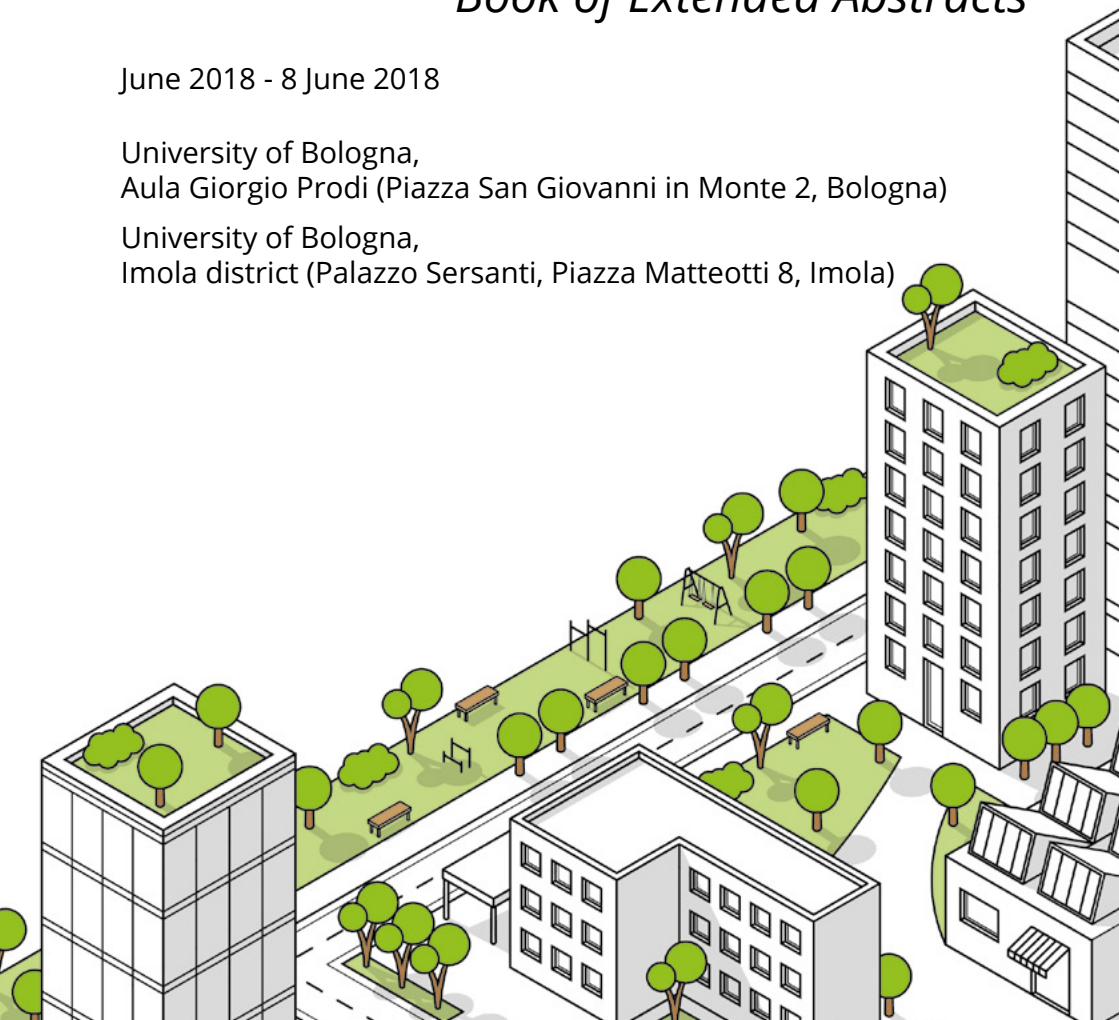
Healthy landscapes: green, regeneration, safety

Book of Extended Abstracts

June 2018 - 8 June 2018

University of Bologna,
Aula Giorgio Prodi (Piazza San Giovanni in Monte 2, Bologna)

University of Bologna,
Imola district (Palazzo Sersanti, Piazza Matteotti 8, Imola)



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New technologies for the landscape setting: immersive views

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Abstract

Visibility analyses are no more aimed at spot investigations, but have become an instrument within the planning and authorization process of local authorities, allowing to check design alternatives in an interactive way. However, today more innovative tools allow a greater immersion and the possibility, not only for the designer, but also for citizens, to realize the implications in terms of visual design of new developments and choices.

The new Mixed Reality (MR) approach, where virtual objects are superimposed to reality through glasses or other devices that allow direct viewing of both what surrounds the observer and of the virtual images seems to have the greater potential to be applied for landscape settings analysis since it is possible to directly observe (virtual) project objects and entities into a (real) environment. Some preliminary investigations in this area are presented in this work.

Keywords: Mixed reality; Virtual scene; Observer

Introduction

Through visibility analysis, it is possible to give designers and stakeholders tools that can be used to verify the impacts of what is being planned and to estimate the landscape setting of new developments. Therefore, visibility analyses have recently become not simply an instrument aimed at spot investigations, but also an instrument that enters the planning and authorization process, allowing both the designer and the landscape authorization authorities to check design alternatives in an interactive way.

At the same time, web-based visualization technologies that present dynamic

virtual environment have gaining attention in many land-related fields, as VR (virtual reality) provides the user with a sense of being surrounded by real world (Jamei et al., 2017). As a matter of fact, since 2011, researchers in the landscape and planning sector became aware of the fact that virtual environment games may be used as a source of information for players, researchers and decision-makers (Bishop, 2011), to elicit environmental preferences and judgments, explore human decision making processes, and support public multi-disciplinary decision-making. What seemed visionary in 2011, has quickly become reality since there has been a rapid grow of virtual and augmented reality also in the 3D landscape visualization (Lovett et al., 2015).

Various applications of VR to the design of cities have been done with regards to pedestrian thermal comfort, audio-visual design of an urban public spaces (Echevarria Sanchez, 2017), urban sound environments (Jiang, 2018), smart transportations, cognitive psychology and behaviour in architectural and urban design, personal health and well being (Boulos et al., 2017).

Materials and methods

In fact, today more innovative tools allow a greater immersion and the possibility, not only for the designer, but also for citizens, to realize the implications in terms of visual design of new developments and choices.

To this regard, various techniques can be used (see Figure 1).

In the AR (Augmented Reality) information concerning real existing objects is conveyed to the final user through portable instruments that are directed towards the areas of interest (Minucciani & Garnero, 2017). It is therefore an overlay of computer generated content on the real world, but the computer generated content and the real-world content are not able to respond to one another.

In the VR (Virtual Reality) an immersive, purely virtual scene is displayed, thus alienating the observer from the real world (George et al., 2017);

Contrarily, in the MR (Mixed Reality) virtual objects, for example projected entities, are superimposed to reality through glasses or other devices that allow direct viewing of both what surrounds the observer and of the virtual images (Ohta & Tamura, 2014). It is therefore an overlay of synthetic content that is anchored to and interacts with objects in the real world and in real time.

In a MR experience computer-generated objects are visibly obscured by real objects in the physical environment. In other words, MR can be seen as a subset of AR, but not all AR is MR.

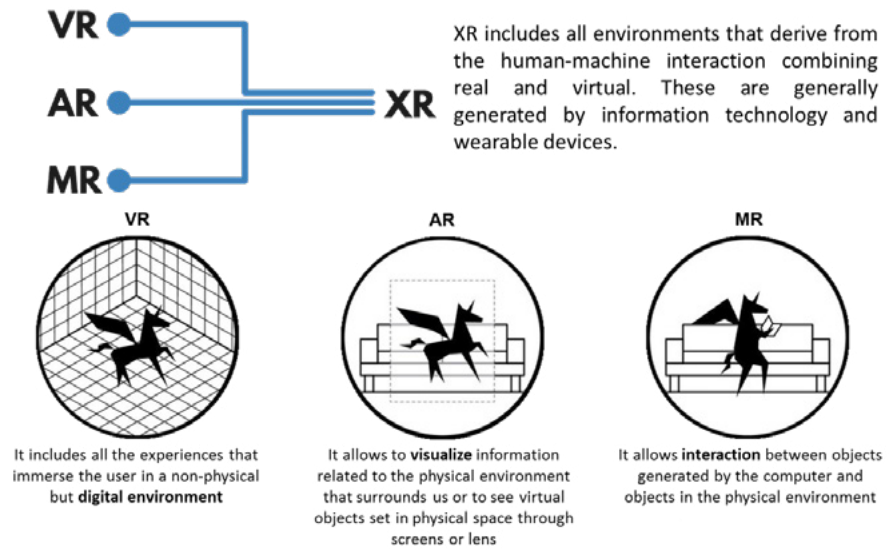

Figure 1. Main differences between VR, AR and MR.

It is precisely these latest technologies that have the greater potential, at the moment, both in terms of technical works (e.g. in case of underground networks and infrastructures), but above all, from the point of view of the landscape analysis and setting, in which it is possible to directly observe project objects and entities.

There are various possibilities for using MR in the fields of planning, landscape and cultural heritage. Hereinafter some examples:

- it is possible to insert an element designed within a real context, in order to evaluate in an immediate and immersive way, what are the visual and functional interactions of the proposed new development in relation to the pre-existing ones;
- the above can also be used in relation to possible participatory decision-making processes, in which citizens can be called to express their opinion not following the examination of graphic representations,

but seeing directly and in place the outcome of the design, through technologies that, although complex, allow for immediate interactions;

- in the cultural heritage field, it is possible to insert in the real and current environment architectural features and buildings that have been moved or destroyed: the virtual modeling of an object, carried out from historical information or, in the event that the object has only been moved, performed through photogrammetric modeling with the production of point clouds, allows to insert the missing object in the context for which it was born, thus giving the visitor the possibility to evaluate the realistic insertion.

Results and discussion

To give an example and a practical application of the use of MR in at a design and planning stage, in Figure 2, an example of a virtual reality realized by some of the Authors of this work is provided. It was done to verify the design of a new pavilion and new trees within a green public space in Turin.

Figure 2. Example of MR visualization for design: frame of the immersive video of a new pavilion into a urban square garden.

In this case study, for the model of the pavilion and the trees, models available on specialized open datasets on the net were used, and were placed inside a

green area belonging to District 2 of the City of Turin. Once the projected objects were anchored to the surrounding reality through a special QR Code, the observer can freely move around the park, verifying in the simplest way, i.e. walking and watching, the effects of the insertion of the project in the pre-existing reality.

In this application, the open source Unity software tool was used as a graphic engine, while the Microsoft HoloLens glasses were used as display device, whose features are easily available on the net.

Conclusions

XR applications are widely spreading in many fields, from gaming to science. The main features of the MR applied to design and planning into spatial problems were summarized in this work. A simple example of application was realized in order to verify the feasibility and the potential of the proposed approach for the design of new architectural objects into real existing green spaces.

References

Bishop, I.D. (2011). Landscape planning is not a game: Should it be?. Landscape and urban planning, 100, 390–392

Boulos, M.N,K., Lu, Z., Guerrero, P., Jennet, C., Steed, A. (2017). From urban planning and emergency training to pokémonGo: applications of virtual reality GIS (VRGIS) and augmented reality GIS (ARGIS) in personal, public and environmental health. International journal of health geographisc, 16:7, 1-11.

Echevarria Sanchez, G.M., Van Renterghem, T., Sun, K., De Coensel, B., Botteldooren, D. (2017). Using Virtual Reality for assessing the role of noise in the audio-visual design of an urban public space. Landscape and urban planning, 167, 98-107.

George, B.H., Sleipness, O.R. & Quebbeman, A. (2017). Using virtual reality as a design input: Impacts on collaboration in a university design studio setting. Journal of Digital Landscape Architecture, 2, 252-259.

Jamei, E., Mortimer, M., Seyedmahmoudian, M., Horan, B., Stojcevski, A. (2017). Investigating the role of virtual reality in planning for sustainable

smart cities. Sustainability, 9, 1-16.

Jiang, L., Masullo, M., Maffei, L., Meng, F., Vorländer, M. (2018). A demonstrator tool of web-based virtual reality for participatory evaluation of urban sound environment. Landscape and urban planning, 170, 276–282.

Lovett, A., Appleton, K., Warren-Kretzschmar, B., Von Haaren, C. (2015). Using 3D visualization methods in landscape planning: An evaluation of options and practical issues. Landscape and urban planning, 142, 85–94.

Minucciani, V. & Garnero, G. (2017) When the cultural heritage can not be physically visited, Atti del Convegno World Heritage and Disaster – Knowledge, Culture and Representation, Aversa-Capri, 15-17 giugno 2017, pagg. 508-517 (ISBN: 978-88-6542-582-4).

Ohta, Y. & Tamura, H. (2014). Mixed Reality: Merging real and virtual worlds. Springer.

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