

# Virtual Museum as a New Reality: the Case of the “Paper Architectures” Rebuilt

Barbara Guastini

**Abstract**—The main feature of this research is to investigate the potential of virtual reality on architectural visualization. Not only as a representative instrument, but also as a new canvas in which architectural design process can take place. To evaluate this chance has been adopted the museum typology: its structure allows to host a wide variety of collections, like 3d digital arts model, 3d reconstructions and so on. Basically everything that was born inside the virtual dimension could find a showcase in this project. Thanks to the flexibility of this instrument, every collection can be modified, revised or increased during time. It could be seen as a “never ending” project. Because of that this museum could actually become an online platform, for sharing personal experiments or studying others. The research is based on designing the museum’s virtual structure and its content; the first collection prototype is based on—as they’re called- visionary architectures: born on “paper” and never built. This collection tries to rewrite the usual approach to the “paper architectures”, increasing their value and their suggestive nature thank to the virtual reality. The project rebuilt this artworks adding them the third dimension, that gives them the opportunity to be explored as real buildings. Inside the virtual dimension these artworks don’t have to deal with any technical issue and they can live as in their authors’ mind.

**Index Terms**—Virtual Museum, Augmented Reality, Visionary Architecture.

## I. INTRODUCTION

The project of a virtual museum arises from the stimulus to focus on how architecture, and specifically the design process, could possibly be applied inside the virtual dimension: a non-physical dimension, free from any space-time connections and any gravitational references. *Space*, *time* and *gravity* are three fundamental variables owned by architecture, so how could this subject relate itself whit a dimension whose properties are completely different from reality? This question has been the challenge of the current research: designing a museum and its prototype collection leaving all the material, technical, and physical references of architecture. To understand the meaning of such a powerful instrument, as the virtual is, it seems necessary, or helpful, to investigate firstly what are its relations with the term *digital*, and obviously with its ancestor *analogical*, especially to evaluate what has changed inside the world of architecture, and how the new digital instruments have improved its construction and representation. Secondly, according to the fact that nowadays the architecture virtual model is a quite usual step inside the design process, a range of virtual architecture, born inside this dimension, or

conceptually close, will provide to get into the deep of the project concept; the relation between *virtual* and *architecture* will unveil the essential variables to consider, trying to understand, under the light of the considerations made, if it’s possible to design architecture following the virtual reality rules.

## II. ARCHITECTURE AND DIGITAL

Certainly digital has appeared inside XX Century society not as an unexpected guest, but as an answer to certain needs, especially the one to speed up the transmission of an information, translating its code in what we call *bit*. So if initially the term digital was just associated to communication, slowly this adjective has been joined with many other words, belonging to innumerable fields of application. Digital has really changed the world of transmission and representation of a content, and this change has obviously affected architecture which has faced the opportunity to use a new tool, the computer, and a new language, digital, to express itself.

According to the variety of digital uses that architecture has adopted in time, it is possible to understand clearer the connection between these two terms through a classification, based on the scope of use, of several authors in the recent architecture’s history.

The first area can be defined as *instrumental*; that means that a series of complicated technical problems has found an easier and faster way to be solved in computers. The *Guggenheim* in Bilbao by Frank Ghery is an architecture born trough a traditional design process, with paper models and sketches, which has found later, in the virtual models, the way to decline the surfaces’complexity shaped by the architect. This is a clear example of digital as a tool to solve technical problems about the construction; a term that appears later, after that the main concept of the building has already been defined. In this case digital is not actually *organic* to architecture, but just to its realization.

The second area is the one that could be called as *creative*, in which there is a total eclipse of the architectural weight in favour of a continuous shape made by abstract surfaces; they describe a dimension in which is no longer possible to distinguish every element, but they interlock themselves in a fluid shapes, as inside Greg Lynn’s experiments. An absolute space continuity, a unity form flows like a fluid inside his visionary architectures; such images are quiet impervious for an observer, their discontinuous narrative dimension seems to reject any kind of perceptive attempt.

The last field of interest is the *utopian* one: here digital

Barbara Guastini, Scuola di Architettura, University of Florence, Florence, Italy

leaves any kind of reference with reality and the world of physical shapes, to become pure evanescence. In this area all digital resources are exploited in the most complete and extreme way, showing worlds that is more possible to imagine than to describe. Marcus Novak shows his interest in the virtual world through a theoretical work; his artworks embody the philosophical and mysterious concept that lies behind their colour, reflections and shapes. A self-related dimension without any reference to reality.

### III. ARCHITECTURE AND VIRTUAL

Digitization has really changed the method of thinking about architecture, modifying not only the process but also the results. But if the digital tool has led to translate content, images and information in a new and faster way, the virtual dimension has definitively extended the representation boundaries to a new reality. The advent of modelling software has increased the possibilities of experimentation into the graphic field, introducing tools and techniques that has changed not only the way of representing, but also the design process itself. As a fact this method has facilitated and improved the architectural design process: the designer can *see* and *for-see* the outcomes of his architecture, correcting and noticing details, that sometimes come out only during the construction phase.

What is called *Virtualization Process*, according to Pierre Lévy theory, is a backward process that produce, as a result, a larger and more substantial information; that is because it refers to the virtual dimension, a further problematic field. This backward information is obtained transforming an actual fact (an object, a building) in to its virtual model; this process of *re-construction* of something real, gives the “virtualizer” a chance to learn and to understand better the object, its geometry, its structure, every detail it has.

Modelling software, for its limitless dimension and total freedom, offer the perfect canvas for artists’ imagination: they are able to act like sculptors, shaping, stretching and smoothing a virtual material. The artworks of few architects like Marcus Passing, Greg Lynn and Makoto Sei Watanabe are bright examples of what could be a possible connection between architecture and virtual; in all of their project the boundaries between architecture and abstract become thinner and thinner, taking the risk of being criticized for they self-reference formalism.

Greg Lynn shows his attempts to give a definition of virtual through architecture: his projects, born actually inside the virtual dimension, with their surfaces and shapes, try to explore all the possible geometries. The computer, in this case, becomes a *creator machine*, not just a tool, that gives birth, whit his casualty and its parametric results, to architecture. However, Lynn doesn’t forget the lesson of an architecture achieved and achievable, so beyond the visionary architectures he has designed, keeps defending man as his last architect. *Induction Cities*, by Makoto Sei Watanabe is probably one of the most curious examples of virtual architecture: trough the calculations made by a software, that a has collected data and information, what outcomes is a self-generating project of an urban settlement. Even in this case the computer is the generator of architecture, the designer has just invented the process to

reach a result, not the result itself: *a design without design*. It seems right to ask ourselves if it’s still possible to talk about built architecture as the only one place in which the perception experience is real; after all the considerations made it seems that virtual dimension has started to be such a more interesting place in which architecture can live: the limit between architecture and virtual is no more distinguishable. The project starts right from this point; it is a fact that architecture has re-invented itself with the new instruments given by virtual, but what happens if it tries to go beyond? What would happen if architecture started to use virtual rules to design itself? The research and the construction of this project tries to evaluate this possibility: an architecture designed with *no time, no space* and *no gravity*.

Designers in the virtual world are no longer creators of spaces, but designers of experience. Virtual reality is characterized by multimedia and interactivity, for being an event, a situation in which the user is involved. As a consequence, designing architecture following this rules, means designing the *experience of virtual architecture*, the event of an architecture.

### IV. THE PROJECT

The typology of the museum has been chosen because of the large contemporary digital art production, that recently has reached really high quality standards, which includes three-dimensional artworks made by all of those artists who work exclusively through modelling software. These authors use virtual dimension as a blank canvas in which they can draw and shape their own fantasy.

It was curious to realize how the virtual nature of all these artworks was completely forget in the moment they had to be showed or communicate. The third dimension was “real” just during the process, not visible in the result. That’s because every finished artwork is printed or seen on a screen, and their virtual dimension just fade away in favour of a bi-dimensional support. Like transforming a sculpture in photo of it. Obviously this procedure is not to be referred to authors’ willingness, but just to a practical need of art communication. So it came the idea to provide for an appropriate place for these artworks: a space in which they could live naturally, maintaining their nature of three-dimensional objects, without any modifications. A virtual museum (Fig.1), or an archive, that could host virtual creations to be seen and visited for their true nature.

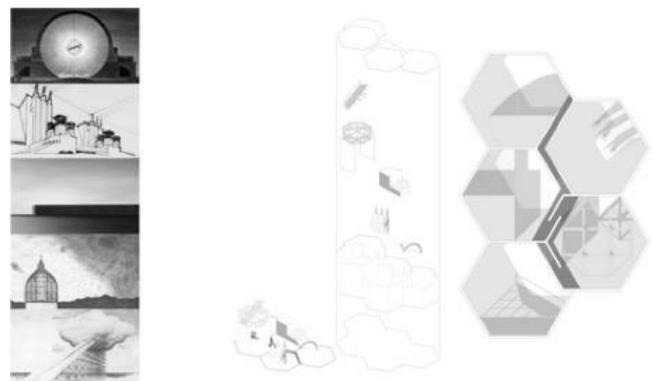


Fig.1

The first collection prototype focuses on visionary architecture. Five artworks have been chosen on the vastness of historical examples from the 18th century to today. The selection has been guided by the clear intentions of the authors: drawing something of pure fantasy, with no reference to reality issues, like materials or gravity. Just creative exercises, the purest synthesis of image and fantasy. These artworks live inside the museum under a new light, a new prospective light; the one of three-dimensionality. They live like real architectures that can be visited as real buildings. The virtual dimension represent the only place in which these creative fantasies can relive. The collection includes:

1) Louis Boullée: *Cenotaph of Newton*. The “revolutionary architects”, Ledoux, Boullée and Laqueu formed an artistic group which really shocked the usual architecture of the 18th century. «True architecture born from a creative inspiration [...] must be the free creation of fantasy» Boullée claimed. This spirit that has guided all of his architectures, motivates his inclusion in this collection; through elementary forms, titanic scales and evanescent lights, the author tries to free visitor emotions; no practical implications prevent Boullée to look for a new “order”, creating an architecture that, more than a building, becomes an expressive painting full of enchanting poetry.

2) Antonio Sant’Elia: *Drawing for Centrale Elettrica*. This monument of the “energetic religion” is another selected artwork. Inside the Italian Futurist delirium, Sant’Elia makes his way becoming the official architect of this new avant-garde: refusing the past and the architecture state of the early decades of the 19th century, he tries to go further, and beyond the traditional city structure. Industries, new technologies embrace the future the author imagined, becoming a symbol of a new age. A sense of detachment, rapture, is clear in his artworks: Sant’Elia shows us a new relationship between people and city, which becomes more similar to the one between worker and factory.

3) Haus-Rucker-Co: *Big Piano*. Radical architecture makes its way between the ‘60s and the ‘70s, spreading all around Europe and beyond. This group of architects can be included in this new wave: they create cinematographic architectures, much closer to a scenography, which underline, in a futuristic and perhaps inconsistent way, the role of man as a spectator, but firstly main actor inside the theatre of life. It is quite clear that they look for a new perspective of architecture. A search for something new, a new architecture that gives man the chance to get away from what is ordinary.

4) Brodsky & Utkin: *A bridge over a precipice in the high mountains*. “A chapel with glass walls, glass roof and glass floor, which stands on the incommensurable and infinite gap between two abysses, above and below.” This is the description that the authors include on the canvas of this print. This architecture recalls, both for the technique and for the graphics, a bygone past: quite classical, certainly traditional, that seems to bring back to a happier moment, more than the present in which these artists live. This “paper architects”, so called, escape the present through utopian journeys, forgetting the desolate and austere architectural present. A vision that, this time, escapes the “modern”.

5) Giacomo Costa: *Orizzonte 18*. Giacomo Costa is an artist that belongs already to the digital world, and for this reason represent a clear example of what could be the future function of the museum project. The architectural element is something, as he says, that has appeared naturally during his artistic path: he has never studied architecture, but he is firmly convinced that architecture is the brightest example of what happens to society during transformation, during time. Changes that are readable in each one of his artworks, showing one time an apocalyptic chaos, or as in the artwork selected, the solitude of a place in which there’s nothing, there’s no human being, just loneliness.

The logic structure of the project is based on two fundamental concepts: *depth*, meant as the capacity of exploring something, like it happens in the real world, and the concept of *possibility*, or freedom of choice. These terms have been represented through an *iceberg* structure: two levels have been design which correspond to two different levels of perception; the lower one, which is bigger, is the level that can be explored and visited by users. In this way the idea of discovery becomes a real experience: users may or may not find out what lies behind the tip of the iceberg, if they are not interested in what they see at the first level, they can go further looking for something more exalting. In this way the concept of depth and possibility finds each other: inside *Level 0* the user will see a portion of artwork, a section, something that could stimulate his/her curiosity, if interested, the user can go down to *Level -1* discovering and visiting the all artworks.

*Level 0* (Fig.2) is configured as a “traditional” museum, made by a series of rooms which contains a piece of artwork. *Level -1* (Fig.3) exploits all the potential offered by virtual, becoming a completely immersive level in which the user can visit three-dimensional objects as real buildings. Summing up, if at *Level 0* we can observe “A” from a specific point of view, inside *Level -1* we are actually “inside A”: the gate between this two level is the artwork itself, thanks to a specific platform indicated on a small map that the user can see on the display or inside the Oculus, orienting him/her during all the tour.

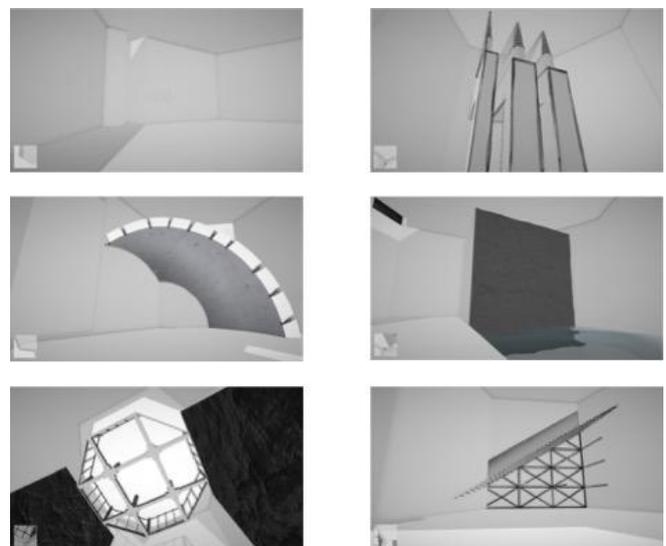


Fig.2.



Fig.3.

In this project virtual is used not only as a visualization tool, but firstly as the main conceptual guide of its structure; it is the only instrument that gives these visionary architectures, or digital artworks, the chance to live as real buildings, or sculptures. The main feature of this project is to underline the importance of the virtual as a concept, made by rules and properties, and of course as a technique that could be helpful in some cases, but not in everyone. The risk of using this new technology unconsciously, just because we can, could make all the virtual experimentations just a superficial way to represent objects: a new make up for ordinary things.

Instead should be important to understand this dimension for its true nature, using this tools in its whole potential; that doesn't mean being an expert in modelling or gaming software. Of course these kind of projects need a technical support, but firstly they need a *reason*; sometimes virtual reality project are empty, useless or bad-designed, they seem to talk about just technology. But virtual is more than this. Considering that we live in a society saturated by images and graphics, our mission should be trying to add a content, not just a new shape.

#### V. CONCLUSION

This project offers a lot of possibilities: it could be an archive in which professionals, teachers or students could share their models, and learn from others. It could be also a digital and virtual structure that could work as an appendix, an *extra*, to museums of modern art, giving the chance to those virtual artist, to show and expose their production.

But mostly, this experiment tries to understand virtual as a “way of being”, his relationship with architecture, and first of all this research provides to build a strategy to stimulate a conscious approach to the virtual concept.

#### REFERENCES

- [1] C. Acciaini, V. Cappellini, *Reale e Virtuale nei Musei*, Pitagora Editrice, 2008
- [2] M. Allen, *Archeology of the Digital*, 15 maggio 2013, in <http://www.domusweb.it/>
- [3] I. Asimov, *The Rest of the Robots*, New York, Doubleday, 1964, trad. it. di G.L. Gonano, *Il secondo libro dei robot*, Milano, De Carlo 1968
- [4] G. Balbi, P. Magaouda, *Storia dei media digitali: rivoluzioni e continuit *, Laterza, Libri del tempo 2014
- [5] Z. Bauman, *Modernit  liquida*, Laterza, Roma-Bari 2002
- [6] D. Bertol, *Designing Digital Space: An Architect's Guide to Virtual Reality*, Wiley, 1997
- [7] S. Bordini, *Arte Elettronica*, Giunti, 2000
- [8] L.Caramel,A.Longatti, *Antonio Sant'Elia*,Villa Comunale dell'Olmo-Como, 1962
- [9] R. Coyne, *Cyberspace and Heidegger'spragmatics*, in “Information Technology & People”, 11, 4, 1998.
- [10] G. Deleuze, *Differenza e ripetizione*, Il Mulino, Bologna, 1968
- [11] G. Deleuze, *Il Bergsonismo e altri saggi*, Einaudi, 2001 R. Diodato, *Estetica del Virtuale*, Bruno Mondadori Editori, 2005
- [12] P. Eisenman, *Inside out. Scritti 1963-1988*, trad. it. di M. Baiocchi, A. Tagliavini, Quodlibet, collana Abitare, Macerata 2014
- [13] L. Galofaro, *Eisenman digitale*, Testo & Immagine, Torino, 1999.
- [14] P. Genovese, *Dalla Decostruzione alla Cyber-Architettura e oltre*, Liguori Editore, 2005
- [15] W. Gibson, *Neuromancer*, New York, Ace Book, 1984, trad. it. di G. Cossato e S. Sandrelli, *Neuromante*, MilanoMondadori, 2003 (prima ed. it.: Milano, Nord, 1986)
- [16] E. GombrichE.,*Arte e illusione. Studio sulla psicologia della rappresentazione pittorica*, Einaudi, Torino,1965
- [17] Haus-Rucker-Co, *Aria Aria*, Dumus, n. 499, Giugno 1971
- [18] M. Heim, *The Metaphysics of Virtual Reality*, Oxford University Press,

New York, 1993

- [19] E.Kaufmann, *Tre Architetti Rivoluzionari: Boullée, Ledoux, Laqueu*, Franco Angeli Editore, 1993
- [20] N. Leach, *The Anaesthetics of Architecture*, MIT Press, Cambridge, 1999
- [21] P. Levy, *Cybercultura. Gli usi sociali delle nuove tecnologie*, Feltrinelli, 2001
- [22] P. Levy, *Il Virtuale*, Raffaele Cortina Editore, 1997 M. McLuhan, *Gli strumenti del comunicare, Il Saggiatore, Milano 1995*
- [23] I.E. Nesbitt, *Brodsky&Utkin: The Complete Works*, Princeton Architectural Press, 2003
- [24] P. Queau, *La rivoluzione del virtuale*, in [www.mediamente.rai.it](http://www.mediamente.rai.it)
- [25] P. Queau, *Tra reale e virtuale*, in <http://www.mediamente.rai.it/>
- [26] L.Rossi, *Intervista con Giacomo Costa*, 18 Marzo 2011, in <http://www.lineadisezione.com/2011/03/intervista-esclusiva-giacomo-costa.html>
- [27] A. Saggio, *Introduzione alla rivoluzione informatica in Architettura*, Carocci Editore, 2007
- [28] M.Tafari, *Architecture and Utopia: design and capitalist development*, The MIT Press, 1976
- [29] *"The Foundation of Digital Architecture: Peter Eisenman"*, YouTube video, posted by CCAchannel, 21 maggio 2013, <https://www.youtube.com/watch?v=hKCrepgOix4&t=1778s>
- [30] *"Peter Eisenman in conversation with Greg Lynn"* YouTube video, posted by CCAchannel, 12 aprile 2013, <https://www.youtube.com/watch?v=DURAlLod--g>
- [31] *"Frank Gehrytalking with Greg Lynn"* YouTube video, posted by CCAchannel, 18 aprile 2013, <https://www.youtube.com/watch?v=3BTn9KW62yU>
- [32] *"La comunicazione in rete? Universale e un po' marxista"* a cura di Mediamente-Rai-Educational, <https://www.larepubblica.it>
- [33] *"No maps for theseterritories"*, documentario, Mark Neale, 89 min, Docurama, 2000