

# The Future Application of Virtual Reality Technology in Architectural Design

Jing Xu

Department of Computer Science, Wenzhou Poltechnic, Wenzhou 32035, China.

## Abstract

Virtual reality (VR) offers architect design a lot useful future applications in nowadays. The applications deserve relates researchers and professionals pay attention to the following developments. Apart the architectures practical function, their design also have ornamental function. The ornamental designs usually combined appearance and internal structure design. Both of the design part are equally important for the user. Furthermore, as VR technology continues developing, its demonstrability would keep a persistent development. The sector will focus on how the VR technology help construction industry and relative employees to design and communicate with target groups more visualization and effective.

## Keywords

Virtual Reality; Architecture; Design; Visualization.

## 1. Introduction

The so-called "architecture" is the general term for buildings and structures. Specifically, houses or places for people to produce, live or do other activities are called buildings, such as houses, schools, shops, etc.. Among the contemporary architectural design area, including interior design, the highest priority is adapting the basic living needs to human beings, upon this basis upgrading and optimization are the following requirements. To meet the demand, a relatively stable artificial space should be built by constructing corresponding functions, cooperating with certain material and technical means, and based on scientific laws and aesthetic principles.

## 2. Current display of Architectural design

Real estate and other design projects usually start with a process of "starting from nothing". The design requires imagination and creation to transform a vacant space into a place where people can use and live comfortably without obstacles. The abstract ability of the creator is no less than that of any kind of artist. However there is something quite obviously differs from art, creator needs to communicate with the person ceaselessly in the process of creation, satisfy the demand of different period, including communication with variety target person, waiting for material if the condition is out of stock and compromising with material supplier. Upon these conditions mentioned in the article, the communication usually are inefficient and over abstraction, also it costs a lot of resources in the process of building trust and identity. The display of traditional architectural design is mainly divided into sand table display, model room visit, animation or video demonstration and so on. For example, sand table display and other demonstration methods mostly focus on the display of architectural form, architectural appearance or conceptual effect, while users have to estimate the actual effect through communication and personal imagination without other solutions. Whilst, traditional display and communication between designers and users lead to widely divergent communication effects according to different groups of people and limitations of knowledge and culture.

## 3. Trial display for the future application of Virtual Reality Technology in Architectural design

### 3.1 Display in real estate program

With the development of modern science and technology, the display of real estate and construction industry has gradually shifted from the traditional building models, model rooms, display videos and

other aspects to the application of VR virtual reality technology. The combination of VR and real estate mainly utilizes the characteristics of virtual reality technology to make information experiential. Virtual reality technology not only can intuitively show the designated area by the virtual environments, allowing users to use facilities, walking paths, the be clear at a glance, such as characteristic design can directly show the infrastructure such as indoor drainage system, power supply system to make the trouble back at home of users without planning, more can simulate all kinds of weather conditions, provide Suggestions for further the interior design of emergency and auxiliary.



Figure 1. Interior design in VR

At the same time, when architectural space design has developed from simple structure design to complex and irregular shape design, the standard of measuring architectural design is not only practical, but also focuses on the experience dimension under the development of contemporary technology and the improvement of human life comfort. The experience of architecture was an abstract expression before the emergence of virtual reality technology, but through VR technology, customers can bring virtual reality equipment into the design space, to feel the different effects of different space composition and environmental changes on the user's sense of use, psychology and other aspects. After wearing the device, customers can explore the final appearance of the space, personally feel the story brought by the space, and make communication and decision-making more transparent, open and accurate.

### 3.2 Current trial instances of Virtual Reality Technology in Architectural design

In terms of the artistry of architectural design, the Visual Vocal platform invested by US architecture company NBBJ in 2016 takes 3D design as the basis and applies 3D models in virtual space. In this virtual space, designers will provide customers with multiple design options, customers through immersive experience of different design schemes, choose the best choice. At a similar time, a first sales center in Quanzhou City, Fujian Province, users wearing virtual reality equipment can see a completed house, users can also directly feel the north-south transparent layout, and the surrounding red tiles and green walls of the southern courtyard scenery. In the kitchen scene of the model room, combined with the VR experience application provided by IKEA, users can even choose to open the drawer in the kitchen and view the built-in POTS, pans and tableware. They can also see an information wall about the size of a wall, which shows the daily arrangements of the family. The interactive app can also change the color of the cabinets and drawers according to the user's choice to determine the overall style of the kitchen. In terms of practicality in architectural design,

It is a huge challenge for designers to create an environment that meets both needs and preferences. It needs a detailed and an insightful approach must constantly adapt to changing skills either. Meeting

the needs of the elderly also is an necessary demand to take into account the common types. In addition to the mainstream target group, society nowadays discussions about the housing and care of the elderly have attracted increasing attention. Their autonomy and personality and integration with the community and society participate in it. According to environmental pressure and regional theory, the elderly feel best in a familiar environment, that's the most important requirement. Everything in their apartment or house should be familiar to them. Once a position changed, for the elderly, it would be a huge challenge. Thus, when designing houses suitable for the elderly, architects can refer to a series of guidelines. On a basic level, design more inclusive spaces and buildings are expected to reduce the need for adaptation later stage. Using virtual reality equipment helps elderly to point out their adaptable accommodate needs and the requirements which designer did not considered. Based on the adjustments, individual characteristics such as strength or agility would not be the reasons preventing them from safely using and enjoying all features of their home. The architectural features would be designed inclusively to equalize accessibility, privacy, security, safety and usability of those spaces.



Figure 2. Target room design

#### 4. Conclusion

Overall, replacing the traditional sand table with VR, architectural model, and can be the size of the reduction of real buildings, free scaling observation details within a certain scope, and immersive experience design rationality and practicability of the VR virtual reality technology combined with real estate industry demand for each design create a "real" scenario, the future home is out of the real world the limitation of space and time, before the start of the construction can experience all kinds of design scheme of the actual effect of check-in, making it easy for users to make corresponding decisions.

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