

The Role and Value of Architectural Art for Game Design

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Abstract. Architecture is an important element of game design, and all kinds of architectural art in the game scene provide players with unlimited reverie virtual places and spaces. The article focuses on the application of architectural design in the virtual space of the game, taking the functional attributes of the place element of architecture in the composition of the virtual space as the entry point, and comparing the different attributes of architecture in the real and the virtual space of the game. Architecture and games are often seen as two unrelated fields, but they are closely related. The similarity between game design and architectural design is that they both need to be designed based on certain rules and constraints and take the user's experience into account. Based on this commonality, game designers need to integrate the virtual environment space composed of buildings with the architectural features of the real world in the context of the game, which is one of the most important factors determining whether players can understand and immerse themselves in the game. Game designers often take inspiration from architectural design to help them create realistic environments in their games. At the same time, in games, architecture is not only used as a background for a virtual city or a realistic rendering of an existing city, but more importantly, the well-structured ambient space constituted by architecture is utilised to convey psychological cues such as emotions and feelings.

Keywords: Architectural design; Game design; Virtualisation.

1. Introduction

In the development process of human civilisation, architecture, as a basic element for human survival and development, has been present throughout human civilisation. At the beginning of its existence, the most fundamental significance of architecture is to provide space for social activities such as production and living, work and communication for human beings. With the development of society, the building has undergone various historical and cultural baptisms, and has gradually become a landmark building with its own unique national and regional characteristics. It can be said that architecture has an important significance for human beings.

The same is true of architecture in games. Architecture is an important element of game design and has a significant impact on the overall aesthetic style of the game. Now, all kinds of architectural art in the game scene allow the player to provide unlimited reverie virtual place and space [1]. In the world of the game, drawing on the iconic architecture of various civilisations and designing a detailed and realistic architectural scene, not only can set the atmosphere of the game, so that the player is placed in the humanistic environment represented by the architectural symbols, but also through the architecture of the game to reflect the emotions and connotations conveyed by the game. The game's architecture is the regulating centre of the relationship between the player and the game in time and space. The game's tone highlights the nation's historical appearance, the spiritual style and characteristics of the times, and the living environment of the characters through clever design. The use of different architectural styles caters to the player's requirements for the screen, making social, artistic and commercial intermingling in game scene, and also creating a multi-perspective, multi-faceted game experience for the player.

This paper explores the significance of architectural design for game design, discusses the application of realistic architectural space under different regions and civilisations, and envisions the architectural space in future game design, hoping to provide more ideas for the future game and architectural design.

2. Integration of game design and architectural design

2.1. Architectural Design Principles in Games

Architecture has never been about fitting in with the environment, and the buildings in the game have to follow the most basic regional characteristics [2].

From the perspective of designers, whether game designers or architecture designers, their commonality lies in building out the lifestyle and perceptual experience of the world that people say they need. When architecture is integrated into the game, realistic architectural concepts in line with the logic of human behaviour will bring a better visual experience, thus enhancing the player's true feelings in the game.

From the player's point of view, the building in the game is no longer just a tool for exploring the scene and elements. Jintai Li proposes a triadic subspace division framework of "scene space - fictional space - social space" for the virtual space of video games. The game world should be in line with reality but not limited to the real world. It realises the collision of virtual and reality, promotes the creation and interaction of human function and thinking, and is a place for communication between people.

2.2. Integration of game space and architectural space

With the continuous development of technology, the game space gradually overlaps with the architectural space. It tends to merge in terms of form, material and space, but the presentation of virtual works is different from that of physical works. There are two classic concepts in architecture: people are more inclined to stop and move around in unorganised, diffuse positive spaces such as the middle of buildings and the corners of bridges; on the contrary, negative spaces will prompt people to leave without making too much of a stop [3]. This concept is also widely used in game design. Therefore, the integration of the two industries, architecture and games, not only enhances the artistic value of game art itself but also inspires the expansion of real architectural space.

Narrative structure is an important element of game design. A good narrative structure not only has a mutually reinforcing effect with the gameplay but can also drive players' emotions and enhance the game's immersive experience [4]. In the design of architectural space, designers often mention narrative space, emphasizing a three-dimensional spatial structure so that players can be immersed in the scene and get an easy and smooth experience like a story. Different storylines are interpreted by the different activities of people in the scene, with the architectural scene acting as a "triggering event" and people as the link between the architecture and the narrative.

As in the open-world game "Genshin Impact", we could travel as travellers through seven countries, each of which can be found as prototypes in the real world. The design of Mondstadt City, which is set against the background of medieval Europe, has referred to the architectural styles of many countries, such as Bernier, the capital of Switzerland, Windsor Castle of the United Kingdom, and Tudor-style residential houses, and combined with the plot of the game to modify the details of the iconic buildings, so that players can experience the game as if they were in medieval Europe at the same time. With Chinese culture as the background of the design of Liyuetown, a lot of reference to ancient Chinese architecture. For example, the design of Wangshu Inn refers to the Hanging Temple in Shanxi, the Phoenix Ancient City hammock architectural form. The main town is mainly queer, covered with glazed tiles for the roof, which has been a popular form of royal architecture since the Tang Dynasty in China. In addition, there are Chinese gardens, stone lions sitting in front of the door to dispel evil spirits and other unique Chinese cultural elements, reproducing the style of the Tang Dynasty. The difference in scale between the main character and the real environment, as well as the constant changes in architectural styles, accompany the player's journey, allowing the player to experience different civilisations without leaving home.

A good architecture is like a film, where the creator tells a story, creates an atmosphere and conveys a range of emotions within the spatial scene. As an artistic methodology, each step of spatial

narrativity needs to be interconnected, and attention needs to be paid to the dual presentation of sensuality and storytelling.

3. Architectural design in games

3.1. Western-style buildings

Western architecture usually refers to the architectural styles of Europe and North America from Ancient Greece to the pre-Industrial Revolution in England [5]. Western architecture is sculptural in shape, so two-dimensional ornamental and three-dimensional structural are the focus of its design. Influenced by Western religious theocracy, Western architecture often emphasises eternity and sublimity through huge volumes and transcendent dimensions to emphasise notions of divine power and status. They have strict geometrical shapes and usually render the vertical strength of the house with spires and porticoes with a sense of flare, creating an appearance that is characterised by opposition to nature. The pyramids and temples, representatives of ancient Egyptian architectural culture, highlight this feature. From Ancient Greece to the Industrial Revolution, as civilisation continued to develop, Western architectural styles underwent various changes, including Ancient Greek Architecture, Ancient Roman Architecture, Byzantine Architecture, Gothic Architecture, Baroque Architecture and Rococo Architecture [6].

Gothic architecture developed from Romanesque architecture. Nevertheless, the most important change was the change of the original load-bearing structure, from cross arches to frames, and the emergence of ribbed arches and skeleton coupons [7]. The lateral thrust was reduced as the structure became lighter, and the original buttresses became lighter flying buttresses. The framed structure also allowed the windows to open wide, allowing good light. The Gothic churches transformed the Romanesque style, which was initially heavy and sturdy and emphasised horizontal stability, into a unique form that emphasised vertical lines and a slender rise [8]. For example, the original round arches were transformed into double round-centred pointed arches, visually increasing their vertical upward impulse. Gothic style first began in the Renaissance, with darkness, fear, loneliness, despair and other themes, weaving through the inner world of the sacred and evil edge, depicting love and despair of the struggle, pain and sobriety. Mainly used in architecture, music, painting and other fields, Notre Dame in Paris is a famous representative of the Gothic architectural style. Most of the buildings in this category are derived from the beauty of smooth lines and ornate patterns.

Baroque, meaning misshapen pearl, is an art style that arose after the climax of the Renaissance and is characterised by its grotesque, twisted and irregular art [9]. Baroque architecture is good at using curved surfaces, through the use of a large number of free curves as well as interspersed curved surfaces and elliptical space, the pursuit of dynamic, decorative solid carvings and colours, thus creating a mysterious and magnificent atmosphere. It breaks through the law of composition and general form of traditional architecture, and uses height dislocation and some incongruity between formal components to cause visual conflict and sensory stimulation. The famous Baroque master Polomini designed St. Carlo's Church as a masterpiece that fully embodies the characteristics of Baroque architectural style. This church completely abandoned the Renaissance and its previous architecture through the boundaries of strict geometric composition, indoor and outdoor, almost no right angles, all lines for the curve, many feet, complex decorative motifs, and the use of a large number of carvings and frescoes, colourful and opulent. Corresponding to the treacherous interior space, the church facade is also extremely curved and transformed, like undulating waves. Because the baroque architectural style has a joyful atmosphere, novelty, grandeur, and glory, it is the most adaptable form of hedonism. Therefore, it is also widely used by those who enjoy ornamental buildings, such as squares, street gardens, fountains, and pools. Italy Rome's Trevi fountain is a baroque-style building. It is located in the square and is irregularly shaped, with the fountain on its side [10]. The middle is a triumphal arch-shaped wall, built on both sides of the house. The façade is full of carvings and other ornaments. They are mixed with the fountain, the rock, and the hand of the natural vivid in the novelty and opulence.

Many games are set in Western architecture. For example, in Assassin's Creed Revolution, Notre Dame de Paris is arguably the biggest selling point. Set against the backdrop of the French Revolution, it shows players a series of events during the Revolution through the ups and downs of the protagonist's life. The production of historical games is influenced by history itself. Its themes often require a precise grasp of history. Notre Dame de Paris, as a landmark building in France, is the best choice for the game to build a background model, whether from the fact that it can depict the dark, desperate Gothic architectural style during the Revolutionary period, or from the representativeness it has for the city of France. At the same time, considering the gaming experience of the player who is an assassin in the game, when designing the model of Notre Dame de Paris, the designer has adjusted the roof of the building to make it easier for the player to operate. In addition, there is the Cathedral of Our Lady of the Flowers in Florence, the Cathedral of Santa Sophia, the Houses of Parliament, Big Ben and the Pyramids, and countless other landmarks, which have been perfectly recreated in the game. From the Renaissance to modern times, so many other worlds of great beauty have been put into the game, some of which may have disappeared from the real world, but exist in the form of data in the game for modern people to enjoy. We can follow the footsteps of the game's characters to the Mediterranean coast, the Florence Masquerade, sail in the middle of Venice's watery alleys, and stroll through the shallows of the Bosphorus. The game work presents a multifaceted and multilayered view of medieval Europe from the perspective of an assassin's upbringing. The series of works of Renaissance architecture is perfectly displayed in the game, presenting the city's prosperity, the world's architectural history of the great development and prosperity of the best period.

3.2. Chinese architecture

Chinese architecture is based on the background of its unique cultural vein in ancient China, and the architectural concept is to unite nature and spirit. In many ancient buildings, Chinese architectural art to its unique Confucian cultural lineage as the background, advocating the "unity of man and nature" architectural concept, the spirit of unity with nature [11]. Chinese architecture originated from Confucianism. The building structure is overall square and neat, symmetrical axis, north and south order, and a multi-courtyard structure. Taoist temples and Taoist temples follow this concept. Contemporary online games, especially some of the Chinese stories as the background of the martial arts game, the legend of the game in the architectural scene of the pagoda, temple palace, etc. are affected by the Confucian idea of the unity of man and heaven and the creation of the design. Traditional Chinese ancient architecture is very colourful, with distinct and contrasting tones. The colours of the buildings were chosen according to different needs, customs and habits to decorate the buildings with different colours.

In real life, the appearance of the building in the use of colour is very clever. There can show that noble and gorgeous colours can also be pleasing to the elegant and vulgar colours. These are all in order to follow the role of the colour can show the theme of the building, landscaping at the same time must be integrated into the architectural environment of the surrounding country. Similarly, the game appeared from the life of the excavated building materials should also have colouring in this step. The game scene in the building colours should be with the game's story background, the game's environment and the game around the style of the building to coordinate.

In the "Dragon in the sky" network game, some building scenes used in the Huizhou region are unique to the Zheng faction of the building. Huizhou ancient architecture unique white walls and grey tiles, colour contrast level sense is not only strong and Dan's rich sequence is clear, and was used wonderfully. The architectural structure of the sparse and dense virtual reality of the composition characteristics of the network game interface in the scene more transparent and harmonious, visually giving a person the feeling of beauty. However, these aesthetics are also based on the traditional Chinese culture and beauty of the Shen, and the colour style is aesthetic and far away, quite popular with the game player's love.

Another example is the Chinese-style game "Hundred Scenes of Jiangnan", which features elegant paintings, carved beams and painted buildings, where the player, in the guise of Wen Zhengming,

sends out celebrities from various dynasties to build the Yingtianfu (present-day Nanjing) and Suzhoufu in the late Ming Dynasty. One of the game's most attractive features is the highly restored Chinese architecture. The game's architecture is based on the Huizhou and Suzhou schools, and the game scenes mainly refer to Zhang Zeduan's "Qingming Riverside Drawing" from the Northern Song Dynasty, Qiu Ying's "Qingming Riverside Drawing" from the Ming Dynasty, and the Qing Dynasty's "Qingming Riverside Drawing" from the Qing Dynasty's Courtyard Book, as well as other ancient paintings and historical buildings, all of which have a high degree of reproducibility, and at the same time enable the players to experience the beauty of the ink and water in the south of the Yangtze River.

4. Reflections on architectural design in games

The hut of primitive man is the world's simplest and most basic residential building, the origin of architecture. The spatial enclosure of this kind of building is entirely for the practical purpose of sheltering from wind and rain. With the progress of science and technology and the development of productivity, the building for human beings is no longer just a shelter, people will pay more attention to the architectural design concepts, styles and cultural symbols it represents, while focusing on the practical purpose of the more and more attention to the spiritual needs, which happens to be the game design must be. There is no such thing as pure perception; perception is always full of meaning. Architecture in games must also convey meaning. That is why the creation of architectural designs in games has to be intentional. Without the intention of the architectural works, despite the extreme pattern, patchwork, can only let people have no way to interpret and understand, so that people feel confused and do not know what to say. The final message can only be empty, boring, and meaningless.

Architectural design constantly shapes game content, while game design maps architectural space. In the future, the effective integration and collision of architectural and game design in real life and virtual space will produce different effects.

5. Conclusion

Architecture in reality contains both landscape and structure. In contrast, in the virtual game place, architecture is the main element to create the place and construct the world, as well as the container for players to create the character design. Taking the element of architecture as an entry point, the article explains the function and role of architecture in the scene construction of game virtual space. It discusses the inevitable trend of combining game design and architectural design. Taking the application of Western and Chinese architecture in virtual and real life as an example, the article illustrates the enhancement of architectural design for the game's artistic and commercial value, and for the player's immersive experience.

The space of architecture is to create a place that can be experienced, and the experience of the place is closely related to a certain cultural context. In games, architecture is situated within a larger environmental context (both geographic and cultural) where events occur. On the one hand, the game offers a new possibility for using architecture. On the other hand, it connects the player to architecture through events. The player participates in the game's storyline, fluctuating with the characters' emotions. Architecture becomes part of the player's memory through events. Although the player's understanding of the architecture in the game may be fragmentary. In a way, such a process is no different from real-time. The player's understanding of architecture is superimposed on the context of the game to achieve a diverse understanding of the game's artifacts.

Because of the many cultural characteristics of the game, online games will inevitably become an important carrier for disseminating culture. Game architectural scenes are important occasions and environments for the activities and performances of game characters, which contain time, place and space, show the historical background and geographical environment of the story from multiple angles, and more importantly, reflect the architectural culture and architectural features of the relevant

era. In the virtual online game world, reference to the ancient style architecture to design a realistic game scene, will immerse the player in the game, and at the same time more can convey the cultural connotation of the game and cultural feelings. For example, in games such as Assassin's Creed Revolution, architecture brings an immersive experience and gives the game a sense of historical weight. Game designers look for inspiration in architectural design, and the architectural elements found in the real world are used by designers in the game, which are cleverly transformed into rich and creative character buildings in the game, thus enriching the user's reality experience in the virtual world.

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