

New Solution of Lighting Design: The Aesthetic Remodeling of Media Architecture in city Landmarks

Wang Lu

31356973@qq.com

Zhuhai Institute of Science and Technology, Zhuhai, 519041, China

Abstract. With the new change of technology and people's increasing aesthetic appreciation, the diversification of lighting design is becoming increasingly important. This study aims to explore how lighting design creates rich and diverse experiences for space through the combination of light and color, thereby enhancing people's awareness of lighting design. Through an in-depth discussion and analysis of the aesthetic remodeling of lighting design in urban landmark media buildings, the importance of lighting design in the aesthetic experience of media architecture is clearly emphasized. Subsequently, the study analyzes the influence and effects of lighting design on the aesthetic experience of media architecture. Finally, concerning future urban landmarks, it proposes that the practical application and development trends of lighting in media buildings will become increasingly significant. The purpose of this research is to explore the diversity of architecture while considering the impact of future lighting design on urban building development and environmental protection, aiming to provoke public thought and provide references.

Keywords: City landmark, media architecture, lighting design and aesthetic remodeling

1 Introduction

Today, with the accelerating urbanization process, urban landmark buildings play a pivotal role in shaping the city image and enhancing the charm of the city. As an inevitable product of a modern city, the media architecture injects new vitality and creativity into the city landmarks through its unique lighting design. It paper discusses the reconstruction of the aesthetic experience of media architecture, and analyzes its application and future development trend in city landmarks. In recent years, scholars at home and abroad view the aesthetic of media architectural lighting design in city .

2 The importance of lighting design in the main building

Lighting design is to use the irradiation of light, through the lighting and decoration of the building internal and external environment, to create aesthetic and functional visual effects. Lighting design covers many aspects, such as the atmosphere of light and recognition, and with the help of new technology to build psychedelic visual effect, all is not the icing on the cake to the building itself, form more suitable for people livable environment, it can not only improve the visual impact and recognition, also can provide comfortable, pleasant visual environment, more can give building unique cultural connotation and artistic value.

2.1 Basic concepts of lighting design

Lighting design refers to the use of light irradiation, through the lighting and decoration of the internal and external environment of the building, to create an aesthetic and functional visual effect. It is an art form, involving the interleaving of light and shadow, color collocation, the uniformity of illumination and many other aspects .[1]As is known to all, for the design of lighting, initially is to meet people in the absence of natural light, through artificial lighting to complete their basic life needs, but with the progress of technology and society, people's demand has not only stay on the basic life needs , more is the need to meet in the spirit, such as the most intuitive visual aesthetic feeling to create a comfortable visual environment. At the same time, the lighting design should also have the functionality and artistry of the overall space.

The concept of lighting design will also be redefined with the change of modern technology and equipment. No matter how the lighting design develops and changes, one thing will not change, that is, the artistic effect and interest created by the lighting design, as well as its functionality and practicality, and the main body of serving the masses will not change. Future changes in lighting design will only be technically upgraded. For example, through the help of intelligent control system and dimming equipment, as well as a variety of holographic projection equipment, the ultimate remote control and dynamic of lighting, the adjustment of the system .

2.2 The application and significance of lighting design in media buildings

The history of lighting design can go back to the ancient times of the blood drinking. After entering the industrial Revolution, the invention and popularization of electric light brought the lighting design into a new era. Electric lamp not only has a long service life and high brightness, but also can control the brightness by adjusting the size of the current, providing more possibilities for lighting design . Especially in the commercial center and cultural exhibition hall.[2]

Commercial building is an important part of the city, now most of the commercial buildings are in the direction of media construction, due to the emergence of the media, the appearance of many buildings are large sky screen, besides can do large advertising marketing on the screen, can also act as a city landmark, clock in landmark buildings, this type of building is also called the media construction, in media building lighting design, also need to consider, the main commercial brand image, the demand of consumer groups and the space function of the whole lighting system . Through reasonable lighting design, it can highlight the characteristics and advantages of commercial buildings, and enhance customers' shopping experience and brand recognition.

Lighting design plays a very important role in this building, because it needs to provide the proper display atmosphere for this special nature of the display space. In general, the architectural space of building culture must choose the appropriate light source and different irradiation angles, so as to avoid the appearance and interior space of the whole building just like the main building of the commercial block, and full of a strong commercial flavor. All the light and shadow should highlight the cultural characteristics and value of the exhibition hall.

3 The influence and function of lighting design on the aesthetic experience of the main building

In contemporary urban construction, many urban buildings are influenced by the modern architectural movement. No matter how the architectural form changes, it is undeniable that architecture and lighting are always inseparable. In order to cooperate with the building itself, lighting is being updated in each stage. Modernist architect Le Corbusier once said that " lighting is the key to art.[3] " [] This point of view, he believes that lighting design is one of the important components of architectural art, through reasonable lighting design can create a unique atmosphere and emotional expression, enhance the visual impact and recognition of the building.

This view has been continued to the current lighting design.

3.1 Enhance the visual impact force and the recognition degree

At present, there is a most classic visual feast case in China, which has been applauded by people, and can be said to be the attention of the world at that time. This case is the opening ceremony of the 2008 Beijing Olympic Games. Famous Chinese director Zhang Yimou planned and directed the opening ceremony, using video technology and lighting to present amazing and spectacular pictures to the audience around the world . Among them, the most striking one is the light show. The lighting master uses a large number of LED screens and projection technology to combine lighting and images to create a very visually stunning effect.

Through the unique lighting design, the lighting of the main building can effectively improve its visual impact force and recognition degree.[4] At the opening ceremony of the 8th Henan Provincial Games, the local government selected the venue for the opening ceremony in Luoyang City National Heritage Park, which took the city as the background, the site as the stage, panoramic lights and panoramic images . Provide a visual feast for all the spectators and spectators, traveling through the millennium (Figure 1). The games make Luoyang city once again become the city, people quickly, guide the Chinese large area to the ancient city of Luoyang, but also bring Luoyang city economic development, but also drive the local cultural and tourism output, the Luoyang become a Chinese cultural landmark position stand steady.



Figure 1 Opening Ceremony of the 14th Para Games
(Photo credit: <https://mp.weixin.qq.com/s/00ZaAg0GJXUExbq74T-dQQ>)

Through the above representative cases, it can be concluded that lighting design plays an important role in enhancing the visual impact and recognition of the main building. Designers should pay attention to the use of light and color collocation to create a unique atmosphere and emotional expression; meanwhile, they should pay attention to green and sustainable development to create a more vibrant and competitive media building.

3.2 Create a pleasant visual environment

Master architect Tadao Ando: " Light is a part of architecture. [5]He believes that lighting design is an indispensable part of architectural design, through which reasonable lighting design can create a pleasant visual environment and emotional expression, and enhance the practicality and functionality of the building. He integrates lighting design with architectural design, pursues a natural and harmonious design style, and creates a pleasant architectural space and visual environment for people.

It can be seen that a comfortable and pleasant environmental space is not only a sense of experience brought by the inherent spatial attributes of the building itself, but also needs to match light and shadow to complete various visual experiences. Only from the eyes to the body, can it create a comfortable and pleasant visual environment for people in a real sense. Take the Suzhou Museum of China designed by the architect I. M. Pei as an example, the lighting design of the whole Suzhou Museum fully displays the soft and comfortable visual environment. Here, pei I. m Ming did not adopt a lot of artificial lighting, but with the most simple, the most natural design technique, through the accessories in the building space, doors and Windows, as a medium, using the combination of natural light and artificial light, light scattered in the corners of the museum, create a kind of indoor atmosphere full of natural light. This lighting design allows visitors to feel warm and comfortable during the tour.

3.3 The unique cultural connotation and artistic value of the architecture

Cultural connotation is another important aspect of the lighting design of the main buildings in the city landmarks. Related studies show that the lighting design should give full consideration to the cultural background and regional characteristics of the main building. [6]By combining cultural elements with lighting design, the cultural value and regional identity of the main building can be enhanced. For example, by using traditional local lamps and light sources, or by designing lighting devices with regional characteristics, you can create a lighting effect with local characteristics.

The famous masterpiece of Barcelona , in which the lighting design of the interior church is full of unique cultural connotation(Figure 2).Gaudi uses natural elements such as plants, mountains and rivers as the source of inspiration, properly connecting the light source layout with the building structure, creating a sacred and unique spatial atmosphere and emotional expression. At the same time, in the interior of the church, Gaudi uses non-traditional lamps and reasonable light layout to spread the light in every corner and details of the church, creating a sense of holiness and ethereal space atmosphere brought by religion.



Figure 2 A screenshot of the interior inside the Holy House in Barcelona (Photo credit: <https://mp.weixin.qq.com/s/M8AZ7JHopWcNhQIL3yFA3w>)

4 Highlight the architectural features to create an atmosphere and emotional expression

The most basic role of lighting design in urban landmarks is to highlight architectural features and styles. Through the reasonable lighting design, the key parts of the building can be emphasized, such as the facade, roof, cornice, to make it more noticeable under the night. At home and abroad, there are many landmark buildings vigorously built by the local government to improve the publicity of the whole city. In addition to showing the overall style of the city, the lighting design can also create its own local unique atmosphere and emotional expression for the local area. Through the combination of light and light, we can create fascinating visual effects, enhance the interaction between tourists and the whole city, shorten the distance, and enhance the emotional experience. [7]

The creation of space atmosphere can also realize the diversification and personalization of lighting design through innovative design techniques and technical application, and enrich the visual image of city landmarks. Las Vegas, for example in 2023, became the 2023 annual best praise winner, the giant ball building during the day is through different dynamic head build witty and interesting visual shock, night by light and can illuminate the whole city of artificial lighting, the city under the giant light, just like the day. So far, it is also the world's largest spherical immersive experience center "MSG Sphere" (Figure 3).



Figure 3: MSG Sphere, an immersive experience center in Las Vegas, USA (Photo credit: <https://mp.weixin.qq.com/s/WYmGknnF5MY00Eh10NOCLQ>)

The appearance of the MSG Sphere is called Exosphere, is the world's largest LED screen, the remarkable function is designed to present a series of vibrant art and brand content and design, not only attracted guests in the venue, also attracted viewers from all over the world, and because of the uniqueness of the building, attracted a large number of overseas tourists into Las Vegas.

4.1 Improve the safety and sustainability of the main building of intelligent development

Lighting design in addition to meet the functional and aesthetic, the most important safety can not be ignored, because reasonable and correct lighting design can increase the living and long-term comfort of urban residents. Night lighting can enhance the identification and visibility of the building and reduce the occurrence of criminal activity. At the same time, a good lighting design can also improve the visibility of the building, and help to prevent accidents. For example, the lighting design of the commercial street should not only be beautiful, but also take into account the safety of pedestrians and businesses. Bright lights can illuminate the road, improving pedestrians' security, while also making it easier for businesses to spot potential dangers.

With the progress of lighting technology and the improvement of environmental awareness, the future for building lighting system design will be more and more to artificial intelligence lighting system, and artificial lighting system sustainability and intelligent development has become particularly important, artificial lighting system application environment, environmental protection, environmental protection will become the future lighting application, and artificial lighting system application environment, environmental protection, building lighting through high efficiency and energy-saving LED lights and intelligent control system, reduce energy consumption, reduce carbon emissions. In addition, some city landmarks have also begun to use new energy sources for lighting, such as solar energy, wind energy and other renewable energy sources to provide the energy needed for lighting. For example, the National Stadium "Bird's Nest" uses the combination of LED lamps and solar power generation system in the lighting design to achieve green lighting.[8]

5 Prospect of the future trend of lighting design in media buildings

With the development of LED new light source and intelligent control technology, lighting design with the development of the whole building also achieve diversification, intelligent, but also facing more challenges, due to using a lot of artificial lighting and new technology, for example, according to foreign media reports, an international team using high resolution satellite data and sky brightness measurement draw a pair of the world light pollution atlas , thus, lighting pollution is affecting people normal routine, even to some endangered animals have also brought serious influence. According to the United Nations environment program (UNEP) data (Table 1), especially birds, their survival depends on the sensory environment, influenced by noise and light, the bird clutch number will decline, and by the influence of light pollution at the same time, birds will nest a month earlier than before, lead to hatch ahead, biological species cause extremely reduction. How to achieve environmental protection through technological innovation, maintain the artistic and cultural lighting design, how to avoid light pollution and other problems, to achieve green lighting, this is also an important problem to be solved in the development of future lighting.

Table 1 Written by the author

Data sheets of the United Nations Environment Programme (UNEP)

Biological species	The impact of light pollution	DA	The degree of impact
birds	Night strong light interferes with bird reproduction and migration	Poultry reproductive success rate declines, and migration routes are chaotic	serious
insect	Artificial light sources attract insects, which increase the risk of disease and pest transmission	Crops and ecosystems are more threatened by the risk of disease and insect transmission.	secondary
plant	Strong light at night destroys the growth law of long and short nights	Abnormal plant growth affects the ecosystem balance and stability	serious
aquatic organism	Light pollution from reflection and formation of floating objects in water affects the vision and behavior of aquatic organisms	Reduce aquatic biotic populations that damage ecosystems	secondary
human	Excessive illumination and strong light at night interfere with human life and health	Residents have insomnia, anxiety and other problems, affecting the quality of life	serious

5.1 Smart and green, energy-saving

Intelligent control systems will be more widely used in lighting design, such as the continuous development of technologies such as the Internet of Things, cloud computing and artificial intelligence. Through the intelligent control system, remote control of lights, real-time monitoring, optimize energy saving. This system can automatically adjust the light brightness, color and irradiation direction according to the environment and user needs, and improve the lighting effect and energy efficiency. Intelligent sensing technology can automatically adjust the lighting parameters according to human activities and environmental factors to achieve personalized lighting needs. The technology will not only improve lighting, but also reduce energy consumption and carbon emissions. For example, through infrared sensing or image recognition technology, it can be realized to monitor and track the population, and automatically adjust the lights to provide the best visual effect.

Future lighting design will pay more attention to the use of environmentally friendly materials, such as renewable energy, low volatile organic compounds, etc. After the epidemic, due to higher requirements for the environment, a bacteria control system will even be added to reduce the impact on the environment. At the same time, for the waste lamps and electrical equipment, also need to be reasonable recycling and treatment. Relying on natural resources by adopting environmentally friendly materials and technologies to reduce energy consumption and carbon emissions. Reduce energy consumption, reduce carbon emissions, through efficient lighting design and reasonable lighting solutions. In addition, the use of intelligent control systems and sensing technology can also further optimize energy efficiency. Reduce the impact on the environment through the effective use and management of energy. [9]Green environmental protection will become an important development direction in the future lighting design. Designers need to pay attention to the use of environmentally friendly materials and technologies while reducing the negative impact on the environment and realizing the harmonious coexistence between man and nature.

5.2 Diversification and personalization

With the continuous change of people's aesthetic concept, the future lighting design will pay more attention to diversification and personalization. Through diversified lighting effects and personalized lighting methods, we will inject more creativity and features into the city landmarks.

Future lighting design will pay more attention to the diversification of lighting selection to meet the different needs of different scenes and people. LED lamps, OLED lamps, laser projection lamps, holographic projection equipment and other new lamps will be gradually applied in the lighting design to improve the lighting effect and visual experience. In addition, intelligent lamps that can adjust color temperature, brightness and life will also be more widely used.

Different atmospheres and visual effects can be created through different combinations of lights and scene patterns. The future lighting design will pay more attention to the diversification and personalization of the scene mode to meet the needs of different occasions and users. For example, the lighting plan can be adjusted according to the weather, season, time and other factors, so that the building can present different styles and characteristics at different times. In addition, through the combination of multimedia content, the linkage and interaction of lighting, images, sound effects and other elements can be realized. In the internal space and external space, it can also create different light and shadow changes throughout the year. Even according to the human body temperature and mood changes, the lighting system will automatically adjust the light and shade of the light source.

6 Conclusion

Through the above explanation, it can be seen that lighting design plays a vital role in the shaping of the architectural image acting as a city landmark, and the great influence it brings can not be underestimated. After a reasonable analysis of the lighting design through the case, we can find that the unique lighting design can not only highlight the characteristics and styles of the contemporary main building itself, but also create a unique atmosphere and emotional experience of the space, which is a visual sense that cannot be replaced by other art forms. Secondly, the artistic lighting design can enhance the overall aesthetic value and user experience of the building, and enhance the interaction and connection with the building. Also introduced the lighting design of light pollution, environmental and ecological problems also need to focus on synchronization, the economic benefits and other value than the protection of human survival on the earth more meaningful, the topic of sustainable development is need people to grasp the technology brought by the balance of production activities and living environment.

In short, it has a deep understanding of the aesthetic remodeling of the lighting design of the main buildings in the urban landmarks, which provides a valuable reference for promoting the construction of urban landmarks and the development of architectural culture. With the continuous progress of technology and the continuous change of people's aesthetic concept, lighting design will play a more important role in the future city landmarks, and contribute to shaping the new image of the city culture and enhancing the charm of the city.

References

- [1] He Wei. Media Facade, City Light New Show Field [J] . Decoration, 2015 (3): 20-26
- [2] Gao Di. The development status of smart lighting in urban construction under the background of digitalization [J] . 2024,35(02):32-35
- [3] Chang Zhigang. " Against the" attack " of" lighting " :social responsibility of media architecture [J] . Journal of Lighting Engineering, 2017 ,28 (5): 56
- [4] Zhao Yang. Multi-dimensional spatial design and performance of media buildings [J]. New Building, 2018, (3): 45-50.
- [5] (France) Le Le Corbusier. Towards the new building [M] . Nanjing: Jiangsu Science and Technology Press, 2015 .
- [6] (Britain)Ritter, Develop in Alison, A Wynn Wynn Situation, How Lighting Design Concepts Can Phases [J] .Professional Lighting Design, 2006 ,48(02):51-52 .
- [7] (Japan) Cho Ando. Bai Lin translation. Tadao Ando on Architecture [M] . Beijing: China State Engineering and Construction Press, 2003 .
- [8] Dugar, Amardeep M,Time to Change Faces, Crown Fountain at Millennium Park in Chicago[J] .Professional Lighting Design, 2005 ,43(06):67-68 .
- [9] Scott. A. Lukas. Theme Park[M].Reaktion Books Ltd, 2008.