

Optimization Strategies for Nighttime Landscape of Urban Waterfront Parks: A Case Study of Shenzhen Talent Park

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Abstract:

The creation of nighttime landscape in waterfront parks is a crucial aspect of urban planning and design, requiring a comprehensive consideration of various factors, including landscape planning, lighting design, material selection, technological approaches, and interactive water features. Building upon existing literature, this paper analyzes the strategies and methods for creating nighttime landscapes in waterfront parks both domestically and internationally. Taking Shenzhen Talent Park as a case study, this research summarizes the optimization strategies for nighttime landscape in urban waterfront parks. The aim is to develop a distinctive and artistic nighttime landscape that attracts more residents and visitors, thereby promoting the development of urban culture and tourism industry.

Keywords:

Urban Waterfront Park, Nighttime Landscape Optimization, Nighttime Ambiance Design

1. Overview of Nighttime Landscape in Urban Waterfront Parks

1.1. Definition of Nighttime Landscape in Urban Waterfront Parks

Nighttime landscape in urban waterfront parks refers to the visual representation of parks, plazas, streets, and other areas constructed along rivers, lakes, coastlines, and other water bodies in urban settings during the night. It is an integral part of urban nighttime scenery, characterized by its richness, uniqueness, charm, and cultural significance. Urban waterfront nighttime landscapes can showcase the historical and cultural heritage as well as the regional characteristics of a city, enriching its nocturnal cultural life and enhancing its image and quality. It serves as a cultural calling card for the city, exhibiting its cultural essence and contemporary features, attracting tourists and investors, and raising its profile and reputation. Moreover, it serves as a public cultural facility, providing residents with a pleasant nighttime cultural environment and recreational spaces, promoting their cultural well-being and happiness. Furthermore, it can drive the development of surrounding areas, stimulate tourism and service industries, and contribute to urban economic prosperity.

1.2. Analysis of the Current Research Status on Nighttime Landscape in Urban Waterfront Parks

Research both domestically and internationally indicates that landscape design concepts for waterfront park nighttime landscapes should closely align with local culture and natural environments, adhere to a people-oriented approach, and utilize technological means to create unique visual effects.

Regarding the design of nighttime landscape in waterfront parks, domestic researchers generally agree on the need to integrate local culture and historical backgrounds. For example, researcher Lu Min and colleagues pointed out in their study on the pattern construction of nighttime landscape design in gardens that the design and pattern construction of garden nighttime landscapes require not only modern technological support but also the integration of natural and humanistic knowledge. They emphasized the importance of integrating technology and science into the functional and artistic aspects of garden nighttime landscapes [3]. Similarly, researcher Xu Junli highlighted the excessive similarity of urban park nighttime landscapes in the context of regional cultural perspectives. They emphasized the necessity of integrating regional culture into nighttime landscape design and creating a space and environment that fulfills the functional and artistic aspects of garden nighttime landscapes while considering technical and scientific factors [2].

Furthermore, domestic researchers such as Wang Danyang argue that technological means are essential in the design of nighttime landscapes in urban waterfront parks. In their study on nighttime landscape design using Fuzhou Minjiang North Park as an example, they pointed out that the reasonable utilization of lighting is often overlooked in the creation of modern park nighttime landscapes, resulting in a lack of aesthetic appeal in the overall spatial illumination [1]. Researchers like Wang Pengfei emphasize the “people-oriented” design principle in urban public park nighttime landscape construction, emphasizing the consideration of people's needs when creating urban public park nighttime landscapes [4]. The design of nighttime landscape in waterfront parks should prioritize sustainability and environmental friendliness. Researchers such as Duan Ran have highlighted the prevalent misuse of lighting in parks [5].

Foreign researchers, like Antonella Radicchi, emphasize the importance of considering highly sensitive and special populations when planning nighttime lighting. Providing convenience and comfortable spatial environments for citizens helps enrich their increasingly monotonous sensory world [11]. Researchers like Ivana Rakonjac mention the connection between visitors' sense of security in nighttime spaces and the overall uniformity of lighting in enhancing the livability of open public spaces at night [10]. The judicious use of artificial lighting also holds significant ecological implications for the nighttime landscape of urban waterfront parks.

1.3. Classification of Nighttime Landscape in Urban Waterfront Parks

In ancient times, China began creating nighttime landscapes in gardens, but due to technological limitations, moonlight was predominantly relied upon for nighttime scenery. Famous examples of moonlit landscapes include the “Three Ponds Reflecting the Moon” in West Lake and the “Long Pine Casting Moonlight” in Mount Tai. With the advancement of technology over time, artificial lighting gradually became the primary light source for garden nighttime landscape design, evolving from simple illumination to the creation of various artistic lighting scenes [1].

Currently, the construction models of nighttime landscapes in China can be classified into seven types: cultural heritage-oriented nighttime landscape design, eco-friendly nighttime landscape design, festival and celebration-oriented nighttime landscape design, entertainment and recreational nighttime landscape design, sports and fitness-oriented nighttime landscape design, private event-oriented nighttime landscape design, and leisure and observation-oriented nighttime landscape design [3]. Among these seven design models, except for the cultural heritage-oriented and eco-friendly nighttime landscape design, the majority of the other design models are based on people's entertainment and leisure needs, aiming to create nighttime landscapes that are interesting, interactive, and visually appealing. However, many urban public park nighttime landscapes currently lack artistic elements and mostly rely on a single artificial light source, gradually neglecting the use of moonlight. The design of some waterfront park nighttime landscapes lacks innovation and distinctiveness, failing to incorporate elements that integrate with urban and regional culture. As a result, visitors are left with a relatively bland impression. Therefore, it is necessary to conduct research and investigation from various aspects such as the city's history, culture, and region, taking into full consideration the uniqueness and innovativeness of the landscape.

1.4. The Importance of Nighttime Landscape in Urban Waterfront Parks

As urban dwellers lead increasingly busy lives, nighttime activities have become an important form of recreation. Designing beautiful, safe, comfortable, and vibrant nighttime landscapes in waterfront parks can provide urban residents with a pleasant place for nighttime sports, leisure activities, and social gatherings, thereby improving their quality of life during the evening hours. The nighttime landscape in urban waterfront parks is an integral part of urban nighttime culture and holds significant meaning and value. It is also an important symbol of urban development. Nighttime landscapes can enhance the cultural ambiance and aesthetic appeal of the city at night, attracting more tourists and residents to visit, relax, and enjoy entertainment. Visitors and residents can appreciate the unique charm and cultural heritage of the city while enjoying the scenic beauty, thus fostering a sense of identity and belonging. Additionally, a well-designed nighttime landscape can provide urban residents with an attractive and comfortable space for nighttime activities, promoting their physical and mental well-being.

Furthermore, the design of nighttime landscapes in waterfront parks can reflect the cultural, historical, and regional characteristics of the city, promoting the inheritance and development of urban culture. Different cities possess distinct histories, cultures, and regional features, and the design of nighttime landscapes in waterfront parks should take these aspects into consideration. By doing so, it is possible to create nighttime landscapes that embody the city's characteristics, taste, and charm, thereby enhancing the city's cultural soft power and attractiveness. Nighttime landscape is not only an integral part of urban nighttime culture but also an important means to enhance urban taste, cultural soft power, attractiveness, and improve the quality of life for urban residents during the evening hours.

2. Shenzhen Talent Park

2.1. Park Introduction

In March 2016, the Shenzhen Municipal Party Committee and Government planned and constructed the first urban park in China named “Talent Park.” The park was launched in April 2016 and underwent two years of planning, design, and construction. It officially opened on November 1, 2017, coinciding with Shenzhen Talent Day. Located in Nanshan District, Shenzhen Talent Park is the first park in the country with a talent-themed concept, emphasizing the significance of science, education, and talents in inspiring people to strive for excellence. The park follows the concept of “Talent infuses the park with its soul, while the park embodies the city's spirit.” [7]

2.2. Park Location and Landscape Features

Shenzhen Talent Park is located in the Nanshan Houhai area, which is one of the core regions in the Greater Bay Area and adjacent to the Shenzhen Bay Super Headquarters Base. The park covers an area of 77 hectares, with a green area of 32.5 hectares, and a total construction area of 4,939 square meters. The park has a maximum green coverage rate that can accommodate up to 6,500 people. To the north of the park is the “Cocoon” Sports Center of Shenzhen Bay, capable of hosting large-scale sports and performing arts events. To the west are commercial centers and high-end residential areas such as Huarun Chunsun, Huarun Vanke Mall, Hengyu Shenzhen Bay, and Shenzhen Bay No.1. To the south are the Shenzhen Bay Port, Nanshan Metro Operations Headquarters, Nanshan Foreign Language High School, and government institutions. To the east is Shenzhen Bay Park, which is the most popular waterfront recreational park in Shenzhen. Shenzhen Talent Park benefits from excellent natural resources and a favorable geographical location, showcasing the city's urban landscape. It has become a favorite destination for Shenzhen residents during holidays and vacations. [8]

The design concept of Shenzhen Talent Park is “Talent Infuses the Park with Soul, Park Manifests Urban Spirit,” with the main planning approach being “One Lake, One Shore, Four Axes.” The “One Lake” refers to the lake within the park, covering an area of approximately 30 hectares. The “One Shore” refers to the waterfront landscape along the lake, and the “Four Axes” represent the Talent Science and Technology Axis, Talent Landscape Axis, Talent Art Axis, and Talent Sports Axis. During the design and construction process, Shenzhen Talent Park highlights 20 sets of talent elements, which are reflected through four sections: motivation, communication, activities, and promotion.

In the motivation section, the Talent Meritorious Wall and Talent Star Bridge showcase and commemorate the historical process of Shenzhen's reform and opening-up. In the communication section, the Talent Pavilion and Talent Gathering provide venues for academic exchanges and scientific research discussions. In the activities section, the park features a 2.7-kilometer running trail and a 13,347-square-meter Talent Plaza, providing a place for leisure and entertainment for the public. In the promotion section, attractions such as the Most Beautiful Chinese Characters Corridor, Talent Tower, and Wind Sail Pavilion stimulate people's interest in science, technology, and traditional culture. [8]

2.3. Current Status of Night Landscape in the Park

The park pays tribute to the outstanding talents who have contributed to the development of Shenzhen over the past three decades in a unique way. Regarding the illumination of the entire park landscape, a redesign has been carried out using talent-related elements, creating a themed route for nocturnal park exploration. The park's

night scenery is presented in a distinctive manner, showcasing the talents and their contributions to Shenzhen's development. [7]

1) Pathway Illumination

The pathway system within the park is an important component of the night landscape design in the waterfront park. Proper planning and lighting layout of the pathways can effectively enhance the quality of the night scenery and the visitors' experience. Based on the lighting intensity, the pathway system in the park can be divided into three parts: sports rubber tracks, leisure walking paths, and lawns.

The sports rubber tracks serve as the main sports areas in the park. To ensure safety and provide a pleasant experience for visitors, the tracks are equipped with ample foundational lighting, including streetlights and lampposts, to provide sufficient illumination. This design not only ensures the safety of sports activities but also allows athletes to enjoy nighttime sports with adequate lighting.

The leisure walking paths are essential spaces for appreciation and relaxation within the waterfront park's night landscape. The overall surface of these paths is adorned with light strips, providing soft and gentle illumination suitable for strolling.

A few lawn lights are installed on the lawns, creating a dimmer illumination. The primary lighting relies on the ambient light surrounding the pathways, allowing visitors to enjoy the beautiful night scenery in a comfortable environment.

The basic color tone of the park's lighting is warm, creating a cozy and welcoming atmosphere for the night landscape.

Figure 1 is a live picture of the garden path lighting.

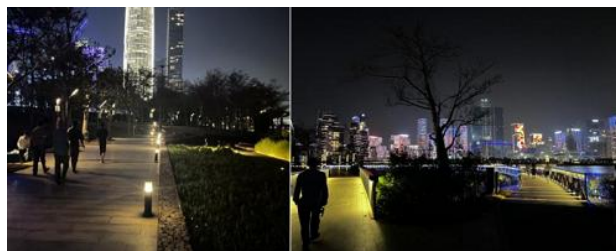


Figure 1. Garden path lighting. Source: author's own work.

2) Landscape Structures and Ornamental Lighting

The landscape structures within the park are themed around talents and primarily include pavilions, corridors, and scenic bridges. Among them, the Peacock Pavilion is one of the most popular landscape pavilions. It is presented in pure white during the day and complemented by blue lights and water mist at night, creating the impression of a peacock in a fairyland. This design symbolizes inspiration and the gathering of talents, embodying the inspiration derived from the "Peacock Plan."

The π Bridge and Talent Starlight Bridge are among the best places to admire the night scenery of Shenzhen Bay. The π Bridge is based on the digits of the mathematical constant pi and has been creatively modified to include the first 2,017 decimal places, commemorating the official opening of the Shenzhen Talent Park in 2017. It has significant educational and commemorative significance. The Talent Starlight Bridge features several illuminated columns, each bearing a commemorative plaque of individuals who have made significant contributions to the nation and Shenzhen. Notable figures such as Yuan Geng, Ma Huateng, Chen Shiyi, Wang Jian,

Cai Zhiming, Zhu Shiping, Xu Zhenghe, and Deng Xingwang are honored on these plaques.

The lighting design of these landscape structures and ornamental elements aims to highlight their unique features and create a visually appealing nighttime atmosphere within the park [8]. The Talent Starlight Bridge is a popular attraction within the park, where visitors often gather to take photos and admire the night scenery. In addition, the park features 39 permanent sculptures that are themed around “talents.” These sculptures depict a wide range of landscape statues that promote excellent traditional culture. Most of these sculptures are illuminated with spotlights, enhancing their visibility and artistic appeal during nighttime.

Figure 2 is a live picture of the park structures and landscape sketches.

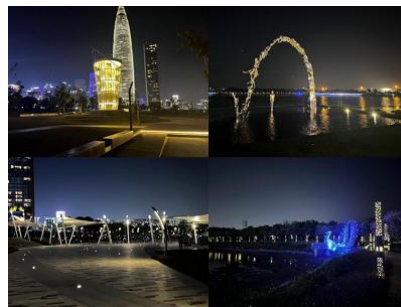


Figure 2. Park structures and landscape sketches. Source: author's own work.

3) Waterscape lighting

In the nighttime landscape design of the waterfront park, the lighting of water features requires careful consideration of the surrounding environment, architectural characteristics, and the park's own unique features and functions. It involves the use of appropriate lighting techniques and technologies to create a night scenery that is contemporary, artistic, and visually appealing.

The main approaches to water feature lighting in Talent Park include the reflection of ambient lighting and the projection of bridge lighting. The reflection of ambient lighting refers to utilizing lighting fixtures in the surrounding buildings and environment to project light onto the water surface, creating a soft and reflective effect that enhances the beauty and layered aesthetics of the water. The projection of bridge lighting involves the installation of lights on the bridges to project their contours and forms onto the water surface, creating a three-dimensional lighting effect that enhances the visual impact and artistic qualities during the night. In the middle section of the Talent Starlight Bridge, there are projected texts on the lake surface. Using projectors, text or patterns are projected onto the water surface, creating dynamic visual effects that add variation and amusement to the nighttime landscape.

Figure 3 is a live picture of the waterscape lighting in the garden.



Figure 3. Waterscape lighting in the garden. Source: author's own work

4) Light show

In recent years, urban light shows have gained significant attention as a highly attractive means to showcase a city's unique features and promote nighttime tourism. They have played a pivotal role in the development of landscape planning and have become an indispensable element in modern landscape lighting design. Many buildings lack visibility during the night, and urban light shows provide a solution to this issue. With the advancement of light shows, lighting patterns have become more diverse. The development of light shows can be divided into two major aspects. The first aspect primarily focuses on using distinctive lighting fixtures and beams that intertwine to create unique spatial landscapes. The second aspect relies on technological advancements and the incorporation of new media techniques, using urban building facades as platforms to create large-scale light shows. The application of new media technologies on building surfaces is considered a crucial medium for urban information exchange, spiritual and cultural displays, and the shaping of the social environment.[7]

The light show at Shenzhen Talent Park is an emerging form of landscape lighting that utilizes media facades to showcase the visual effects of light art. It leverages new media technologies to convey the historical and cultural development of China and Shenzhen. The light show takes advantage of the park's prime location, extensive water features, and multiple optimal viewing points, creating a wide and immersive visual experience. The light show is divided into four chapters: "Spring Awakening in Nanshan," "Technological Nanshan," "Ecological Nanshan," and "Era of Nanshan," each lasting approximately 8 minutes. With the introduction of this innovative form of landscape lighting, the night scenery of Shenzhen Talent Park becomes even more vibrant and colorful.[7]

Figure 4 is a live picture of the light show in the garden.

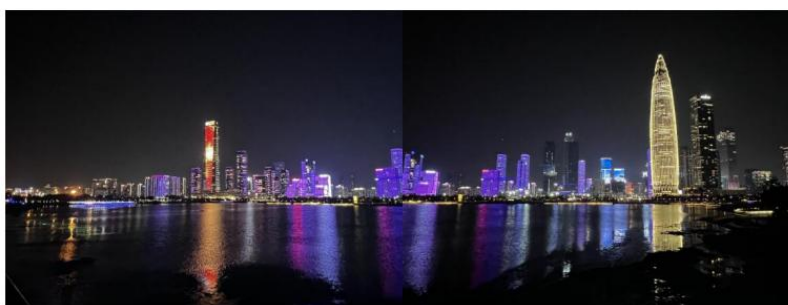


Figure 4. Light show in the garden. Source: author's own work.

5) Design of nightscape sound effects

To create a vibrant and colorful nighttime atmosphere, Talent Park has installed stone-shaped audio devices on the lawn for playing music. These audio devices not only serve the purpose of playing music but also complement the light show within the park. By combining music with the lighting effects, a dynamic and rhythmic nighttime experience is created, enhancing both the visual and auditory aspects for visitors.

2.4. Analysis of the Current State of Nighttime Landscape in the Park.

2.4.1. Uneven Lighting Brightness

There are issues with uneven lighting in the nighttime landscape of the park due to factors such as the installation angle, brightness, and illuminance of the lighting fixtures. Different areas within the park have varying lighting facilities, with some areas having overly prominent light strips that cause discomfort to pedestrians due to glare. Additionally, certain waterfront pathways lack basic lighting infrastructure, failing to meet the basic lighting requirements.[1].Some landscape sculptures and features lack lighting or have limited lighting options, resulting in a disconnect between their lighting effects and the rest of the park's landscape. This lack of continuity compromises the overall visual experience.

Figure 5 is a live picture of the garden lighting.



Figure 5. Garden lighting. Source: author's own work.

2.4.2. The waterfront landscape lighting lacks layers

A well-designed lighting scheme for waterfront areas can emphasize the linear features of the water and create a night scene with rhythm and pace. In artificial waterfront areas, the lighting of the shoreline is typically achieved through the use of strip lights. However, there are current issues with inadequate lighting effects, as well as a lack of harmony between functionality, practicality, and artistic expression. As a result, the nighttime scene of the shoreline fails to capture the essence of the daytime landscape, lacking layers and rhythm. Therefore, improvements and optimizations are needed to enhance the lighting of waterfront areas, creating a more artistic and functional night scenery.

Figure 6 is a live picture of the shoreline lighting.

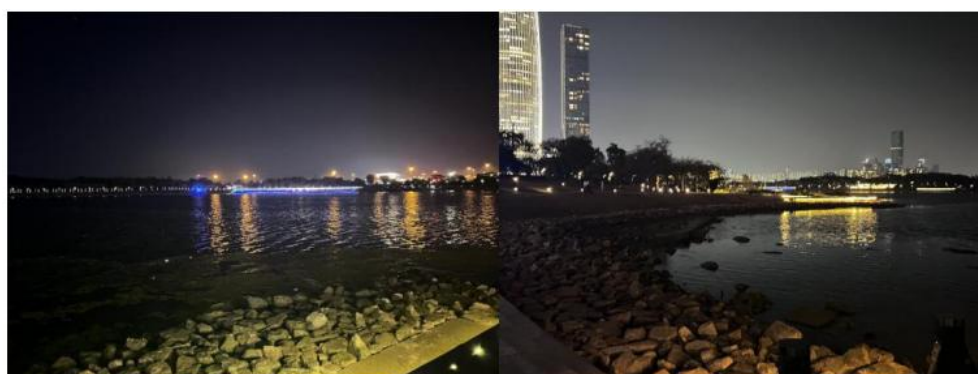


Figure 6. Shoreline lighting. Source: author's own work.

2.4.3. Summary of the advantages and disadvantages of the current state of the park's night landscape

As shown in Table 1.

Category	Advantages	Disadvantages
Path Lighting	Sufficient basic lighting is provided by street lamps and lamp posts, offering adequate brightness and illumination. Soft lighting from strip lights along pedestrian pathways creates a gentle ambiance. Lawn lights contribute to a comfortable environment. The warm color tones create a cozy and welcoming night scene.	Uneven lighting effect due to problems with installation angles, brightness, and illuminance. Significant variations in lighting fixtures across different areas, with some strip lights being excessively prominent and causing glare.
Water Feature Lighting	Surrounding ambient light projection creates a visually appealing and layered illumination effect on the water surface. Projection of lights onto bridges creates a three-dimensional effect, enhancing visual impact and artistic appeal. Projection of text or patterns onto the lake surface creates dynamic visual effects, adding variety and interest.	Insufficient layering in the lighting design for the waterfront, resulting in a lackluster lighting effect. The overall lighting effect for the waterfront landscape is not optimal.
Sculptures and Artworks	The sculptures and artworks in the park are predominantly themed around talents and possess rich symbolism. They contribute to the overall aesthetic and thematic experience of the park.	Some sculptures and artworks lack proper lighting or have limited lighting options, resulting in a disjointed lighting effect compared to other landscapes in the park. There is a lack of continuity in the lighting design, affecting the overall cohesion of the lighting concept within the park.
Light Show with Music	It effectively conveys the cultural essence of Shenzhen. By utilizing the geographical advantages of the Talent Park and the surrounding architecture, it creates a wide perspective and visually rich experience. The light show demonstrates a strong thematic focus and offers a variety of visual elements.	

Table 1. Advantages and disadvantages.

3. Principles for Optimizing Urban Waterfront Park Nightscapes

3.1. Improvement in spatial layout Spatial layout

Optimization refers to the planning and design of various spatial areas within the urban waterfront park nightscapes, aiming to make the nightscapes more rational, beautiful, and practical. When designing the nightscapes of urban waterfront parks, it is necessary to fully consider the functions and uses of different areas within the park,

such as slow-walking trails, leisure squares, recreational lawns, etc., and to divide and plan them reasonably. For example, brighter and more vibrant lighting colors and fixtures should be used in the recreational area to create a cheerful atmosphere, while soft and warm lighting effects should be chosen in the leisure area to create a tranquil and comfortable environment. At the same time, the lighting intensity and types of fixtures in each area should be determined based on factors such as pedestrian flow and green coverage to achieve coordinated and unified lighting effects. Additionally, the spatial layout should also consider the visual effects of the entire park, allowing the lighting effects of different areas to form a unified overall effect and enhance the park's aesthetics and overall image. Improvements and optimizations in the internal spatial structure of the park, such as the installation of lampposts on both sides of the walkways to enhance lighting continuity, can make the lighting effects of the entire walkway more uniform. It is also important to avoid overly glaring lights and ensure a reasonable lighting layout, with harmonious coordination among lighting points and mutual complementation between different lighting elements, creating a better overall nighttime landscape. Through proper spatial planning and layout, urban waterfront park nightscapes can achieve the optimal balance between functionality and aesthetics, providing visitors with a more comfortable and visually appealing nighttime recreational experience.

3.2. Optimization of Lighting Design

When designing the nightscapes of urban waterfront parks, lighting design is a key aspect because it directly influences the overall effect of the park at night. It is not just for nighttime illumination but also to create emotionally engaging, artistic, and unique nightscapes, enhancing the park's visual appeal, entertainment value, and cultural significance. The following will provide a detailed explanation of three aspects of optimizing lighting design.

3.2.1. Application of Lighting Technologies and Techniques

In lighting design, selecting suitable lighting technologies is crucial. Modern lighting technologies include LED, laser lighting, halogen lamps, among others. Among them, LED is one of the most commonly used technologies due to its advantages such as low power consumption, long lifespan, and adjustable color temperature. Additionally, in urban waterfront park nightscapes, the reflection and refraction of water also affect the lighting effects, so lighting design should be combined with optical principles. It is also important to choose appropriate lighting forms, suitable light sources, and develop lighting setups and planning design schemes. The quality of lighting design directly affects people's perception. A well-designed lighting scheme can provide a pleasant and comfortable psychological experience, while poor lighting design can have the opposite effect. There are various lighting methods for nighttime spaces, each of which provides different visual and psychological experiences. After research and summarization, nighttime lighting can be roughly categorized into the following types. [14]

As shown in Figure 7.

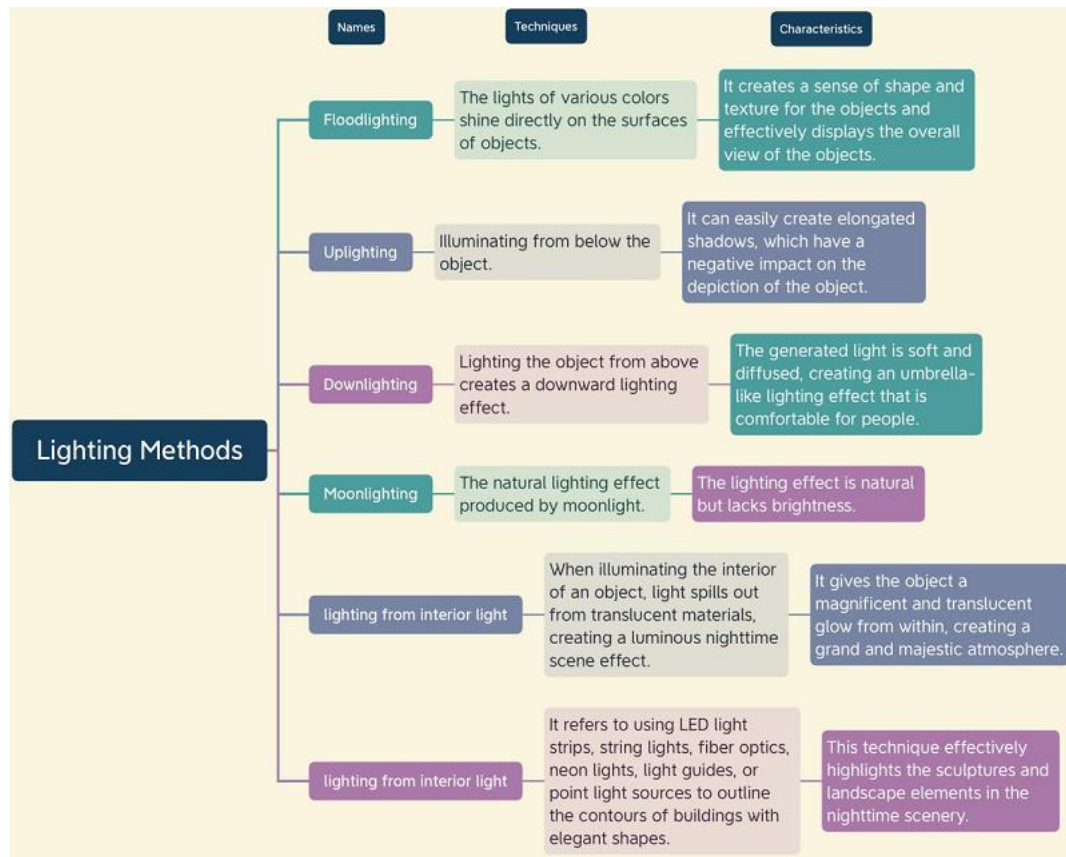


Figure 7. Lighting methods.

3.2.2. Color Design of Lighting

The design of lighting colors is also an important aspect of lighting optimization. Different lighting colors can create different effects. In urban waterfront park nighttime landscapes, a variety of colors can be used, such as blue, green, purple, etc., to highlight the characteristics of water and enhance the beauty of the night scenery. When designing, it is necessary to consider the combination, adjustment, and variation of lighting colors to create a visually pleasing effect. At the same time, attention should be paid to the uniformity and overall coherence of lighting colors, avoiding a single color that may cause visual fatigue.

Figure 8 is a color temperature.

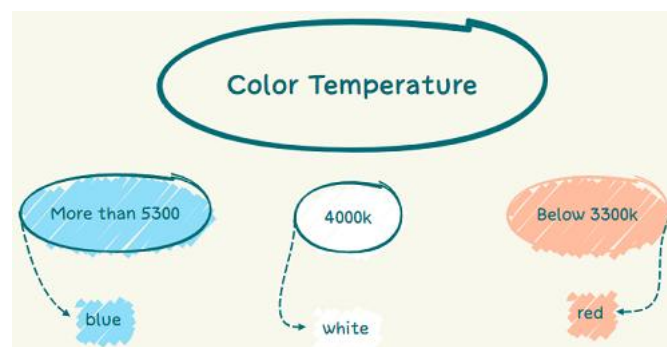


Figure 8. Color temperature.

3.2.3. Selection of Lighting Fixtures

The selection and layout of lighting fixtures directly affect the overall effect of the park's nighttime landscape. When selecting lighting fixtures, factors such as lighting effects, energy efficiency, and waterproofing need to be considered. In terms of layout, a reasonable plan should be made based on the park's topography, landscapes, and other factors. For example, linear lighting such as light strips can be used along the waterfront to highlight the linear features of the water, creating a sense of rhythm and melody.

3.3. Optimization of Environmental Ambience

Optimizing the environmental ambience is about creating a comfortable and enjoyable nighttime landscape by establishing a suitable atmosphere, thereby enhancing visitor satisfaction and experience. When optimizing the nighttime landscape of urban waterfront parks, in addition to lighting design and spatial layout optimization, the optimization of environmental ambience is also crucial.

3.3.1. Preparation and Creation of Environmental Background

To create a better nighttime landscape effect, it is important to focus on preparing and creating the environmental background. For example, adding natural elements can be an effective method. Incorporating green plants or water features into the park's background can add a natural touch to the nighttime ambience, creating a more vibrant and lively nighttime landscape. In terms of lighting design, suitable lighting techniques can be chosen to highlight the characteristics of greenery or water features, enhancing the layered effect of the landscape. Additionally, incorporating cultural elements or art installations can create a unique atmosphere for the park's nighttime landscape.

3.3.2. Design and Configuration of Nighttime Sound Effects

By incorporating elements such as fountains, water curtain films, and musical fountains into the park, music and water can be combined to create a nighttime environment that is more artistic and romantic for visitors. Additionally, specific sound effects can be designed and implemented at certain scenic spots to enhance the immersive experience of nighttime sightseeing.

3.3.3. Integration of Landscape Elements

Setting up a sculpture or landscape installation in the central area of the park can become a highlight of the nighttime landscape through appropriate lighting design. Utilizing spatial layout and landscape elements, a rich sense of depth and variation can be created, resulting in a dynamic and layered nighttime landscape. For example, installing light sculptures with artistic qualities in the central area of the park or placing floating light spheres in landscape ponds. Furthermore, adding distinctive lighting installations in park pathways, green spaces, and water areas can make the nighttime landscape more diverse and colorful. Additionally, interactive games, music performances, and other activities can be organized within the park to enhance the nighttime ambience and increase visitor engagement and enjoyment.

4. Talent Park's Urban Waterfront Park Nighttime Landscape Optimization Strategy

In the nighttime landscape of Talent Park, there are some issues with the lighting design in certain areas. On one hand, some pedestrian paths, small installations, and pavilions lack proper lighting facilities, especially the areas close to the eastern waterfront road after passing the Starlight Avenue. This results in these areas being relatively dim at night, lacking sufficient lighting security, and posing safety hazards to pedestrians. On the other hand, the lighting of the light strips along the waterfront path near the “I Am an IT Person” area is too glaring, not only disrupting the overall aesthetic of the landscape but also causing discomfort for people and reducing the overall touring experience. Additionally, most of the stone pavement on the embankments only has individual light strips, lacking layered lighting that can enhance the water landscape and create a more comfortable environment for visitors. To address these issues, renovations can be conducted within the park.

4.1. Nighttime Pathway Optimization Strategy

Install additional lighting facilities around the pedestrian paths and small installations, such as ground-level lighting fixtures next to lampposts and installations, to increase the lighting brightness. By providing sufficient lighting, these areas can maintain good illumination at night, ensuring the safety of pedestrians. These improvements effectively enhance the visibility of the nighttime landscape, allowing pedestrians to clearly see the surrounding paths and scenery, thereby reducing the occurrence of accidents. Moreover, adequate lighting provides a more comfortable and enjoyable experience for nighttime strolls, allowing people to engage in safe and pleasant nighttime activities within the park. Regarding the lighting issue on the waterfront path, considerations can be made to replace appropriate fixtures, adjust the brightness and angles of the lights to achieve a more comfortable and soft lighting effect, reducing eye irritation for pedestrians.

4.2. Embankment Optimization Strategy for Nighttime Landscape

For the issue of the monotonous lighting on the embankment's stone pavement, it is advisable to consider adding supplementary lighting fixtures, such as ground-level lighting installed in the gaps between stones. This will add layers and aesthetic appeal, making the embankment an integral part of the park's nighttime landscape and enhancing the overall visual experience. Through these improvements, the lighting issues of the park's nighttime landscape can be effectively addressed, creating a more beautiful, comfortable, and safe nighttime environment.

4.3. Optimization Strategy for Nighttime Public Art

Within Talent Park, there are 39 permanent landscape sculptures on display, and temporary sculptures may be added for events or exhibitions. However, some of these sculptures lack proper or sufficient lighting, which diminishes their visual impact and artistic value. Therefore, it is necessary to enhance or optimize the lighting of the landscape sculptures in the park to create a more diverse sense of depth and variation. Specifically, suitable lighting fixtures and angles should be chosen based on the characteristics and locations of the sculptures to highlight their contours and details. It is important to ensure lighting uniformity and harmony to avoid overly bright or abrupt lighting effects. Through the optimization of lighting for the landscape sculptures, their aesthetic value can be enhanced, and the overall nighttime landscape can gain a sense of depth, better reflecting the cultural and artistic atmosphere of Talent Park.

5. Conclusion and Outlook

The design of the night landscape in Shenzhen Talent Park still requires some improvements and attention to detail. With the rapid development of waterfront cities and changes in modern lifestyles, the importance of urban waterfront park nightscapes is gradually increasing, especially as people's demand for nighttime activities and entertainment grows. Traditional methods of creating nightscapes can no longer meet the diverse needs of modern individuals in their nighttime lives. Therefore, it is necessary to adhere to a people-oriented approach, prioritizing the citizens' experience and comfort, while also emphasizing the city's image and cultural display. Attention should not only be given to the layout and design of lighting facilities but also to the integration of natural, cultural, and artistic elements, creating a unique and distinctive night landscape. By adding more cultural and artistic value to the park's night landscape, the park can become an important venue for urban nighttime culture and art.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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