

The Aesthetics of Virtuality and Reality: A Study on the Exhibition Design of Longyan Chen Kema Memorial Hall

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ABSTRACT

Virtuality and reality are a pair of aesthetic categories in traditional Chinese aesthetics. They are interdependent and they transform into each other. In the design of exhibition spaces, the application of virtual and real expression techniques, through spatial layout, display methods, and emotional expression, can effectively convey historical events, character stories, and cultural values. In the exhibition design of the Longyan Chen Kema Memorial Hall, based on the analysis of the four elements of form, color, quality, and light, the author summarizes the three aesthetic values of virtuality and reality, namely "using virtuality to manifest reality" - increasing the depth and multi-sensory experience of space, "using reality to express virtuality" - reproducing and metaphorically representing historical memory, and "the interpromotion of virtuality and reality" - the aesthetic effect of combining movement and stillness.

Keywords: *Virtuality and reality, Display space, Display design, Aesthetic value.*

1. INTRODUCTION

In recent years, the virtual and real design of exhibition spaces has become increasingly important in modern exhibitions and brand experiences. The virtual and real design of exhibition spaces not only improves the quality of audience experience, but also provides more possibilities for the dissemination and educational functions of exhibitions. At the same time, it also has significant marketing value in commercial applications. The virtual and real design of exhibition spaces is shifting from simple visual effects to more complex interactive experiences, using cutting-edge technology to create exhibition environments that can attract audience attention and provide deep participation. This trend not only enriches the audience's experience, but also provides exhibition designers with a broader creative space. The virtual and real design of the memorial hall combines real display and virtual technology, creating an immersive and interactive experience for visitors. This design method can help memorial halls more effectively convey historical, cultural, and emotional content.

2. OVERVIEW OF VIRTUALITY AND REALITY CONCEPT

2.1 *Virtuality and Reality in Traditional Chinese Aesthetics*

As a pair of aesthetic categories, "virtuality" and "reality", "Reality" refer to concrete, tangible, visible, and touchable things, emphasizing objective existence and clear forms. "Virtuality" refers to abstract, ethereal, intangible, and formless things, emphasizing subjective feelings and imaginative space. Virtuality and reality are a dialectical relationship between tangible and intangible, objective and subjective, direct and indirect. They coexist in art and can be described as "seeing reality through form, and thinking through emptiness". The two complement each other and are dialectically unified.[1]

The aesthetic concept of virtuality and reality originated from the ancient pre-Qin philosophical thought of "the mutualism theory of existence and non-existence"[2]. In the Taoist classic "Tao Te Ching", Laozi said, "有无相生，难易相成，长短相较，

高下相倾，音声相和，前后相随。” The meaning is that existence and non-existence are interdependent due to mutual opposition, difficulty and ease are formed due to mutual opposition, long and short are manifested due to mutual opposition, high and low rely on each other due to mutual opposition, voice and sound are harmonious due to mutual opposition, and front and back follow each other due to mutual opposition. The concept of “mutualism of existence and non-existence” here refers to the philosophical idea of the interplay between reality and virtuality, emphasizing the unity of opposites and dynamic balance.

Virtuality and reality are one of the excellent traditions in ancient Chinese artistic creation, and they are also an important foundation for the formation of the subtle, concise, and profound artistic expression characteristics of Chinese literature and art.[3] The combination of virtuality and reality embodies the harmony and balance pursued by Chinese aesthetics, emphasizing the expression of infinite meaning through limited reality. This aesthetic concept has been widely applied in artistic creation. The combination of "virtuality" and "reality" in traditional Chinese aesthetics reflects the fusion of "meaning" and "environment", making Chinese art works full of poetry and philosophy, forming a unique artistic style and aesthetic tradition.

2.2 *Virtuality and Reality in Display Space*

A memorial hall refers to a display space dedicated to commemorating specific historical events, figures, or cultural heritage using artistic design language and visual communication methods. In display design, the combination of virtuality and reality is particularly important. Through clever spatial layout, display methods, and emotional expression, historical events, character stories, and cultural values are effectively conveyed, creating a profound commemorative atmosphere. The following are the specific applications and manifestations of virtuality and reality in the memorial hall:

2.2.1 *Reality*

The “reality” in space represents the physical elements of the space, and the “reality” in display space refers to the real and tangible physical forms, including physical space, enclosed interfaces, displayed items, interactive devices, and other content components. The real space of the display

space is a physical environment with display functions formed by enclosing the wall shaped interface. The various partition shapes in the memorial hall are vivid manifestations of reality, and they are used to divide the area and plan the flow line, with strong privacy. The real interface generated by enclosing the real space, including the top, facade, and ground, creates visual impact through color, material, and other real effects. Heavy color tones are commonly used in memorial halls to express the heaviness of history, and real materials are used to reproduce the texture of historical relics. The real space includes physical displays, and memorial halls often use actual historical artifacts, photos, archives, relics, etc. These physical exhibits convey historical information and emotions through specific forms and details. The display space has the functional attributes of information dissemination and cultural education, so it cannot be separated from the physical interaction between objects and people. The touch screen query system, interactive devices, etc. in the memorial hall allow the audience to obtain information and receive education through practical hands-on operations.

2.2.2 *Virtuality*

The "virtuality" in space represents the virtual elements of space, and the "virtuality" in display space refers to abstract and intangible virtual elements, including virtual space, virtual interface, light and shadow changes, music effects, emotional imagery, and other content components. The virtual space of the exhibition space is an unbounded virtual range, which includes open areas such as corridors, squares, etc. in the memorial hall, as well as a digital exhibition environment created through digital technology and virtual reality (VR) technology. On the one hand, the virtual space provides a space for audience activities and stays through reasonable layout, while enhancing the spatial hierarchy of the memorial hall. For example, the spacious atrium and open square of the memorial hall give people a peaceful and contemplative space; On the other hand, virtual space not only expands the ways and contents of display, but also provides viewers with a brand new interactive experience. In display space, virtual display content is often created through digital technology, projection, holographic imaging, and other means to supplement and expand the shortcomings of physical displays. Virtual reality technology is used to reproduce historical scenes and immerse the audience.

3. THE VIRTUALITY AND REALITY IN THE CHEN KEMA MEMORIAL HALL

The aesthetic principles of virtuality and reality permeate the design of display space, which include four elements: form, colors, materials, and light. The beauty of the virtuality and reality in the display design of the Chen Kema Memorial Hall creates a display environment where the virtual and real complement each other through the processing and joint action of the four elements. The Chen Kema Memorial Hall focuses on the life story of revolutionary martyr Chen Kema as its core content. Based on the logic of the script "Hong Ma", narrative space elements are extracted, and an immersive display space is generated by combining the design technique of translating characters' thoughts and emotions. With the help of stage style lighting design, different emotional spatial atmospheres are created, taking viewers to experience Chen Kema's revolutionary process.

3.1 Form

Form, as one of the constituent elements of exhibition space, is included in the exhibition design of the Chen Kema Memorial Hall, which includes macro level spatial form layout, meso level interface form design, and micro level exhibit arrangement, achieved through the use of elements such as perspective, light and shadow, materials, and color.

At the macro level, the spatial layout of the Chen Kema Memorial Hall is based on the life story of revolutionary martyr Chen Kema. According to the script of "Hong Ma", six major exhibition themes were extracted: origin, expansion of red, danger, execution, maneuvering, and sacrifice. Based on this concept, exhibition spaces for each theme were formed (as shown in "Table 1"). The lobby introduces the background and historical process of the Houtian Uprising - origin; The first exhibition hall introduces the background of Chen Kema's character - expansion of red; The second exhibition hall showcases the emergence of heroic talents and focuses on the shining moment of Chen Kema - danger; The third exhibition hall depicts the scene of Chen Kema's execution and showcases the fearless spirit of revolutionary women, - execution; The fourth exhibition hall introduces the main forms and contents of the women's movement, and showcases the women's

power in the revolution in western Fujian - crisis; Finally, it is a memorial hall for tens of thousands of martyrs represented by Chen Kema - sacrifice. The life story of martyr Chen Kema is "virtuality", forming the six major spatial themes of the Chen Kema Memorial Hall. Under the requirements of functional needs and pedestrian flow, the spatial layout of the Chen Kema Memorial Hall has been formed as "reality". The process of extracting abstract design concepts and transforming them into display themes, and then concretizing them into spatial layouts, is known as "using virtuality to manifest reality".

Table 1. Exhibition list of Chen Kema Memorial Hall

| Exhibition list | | | | | | | |
|------------------|------------------------|---|---|--------------------|--|--|-------------|
| Theme | Area | Summarizing the event | Stage display | Character emotions | Planning content | Exhibition methods | Key word |
| Origin | Lobby | Members of the farmers' association smashed open the granary, and the villagers rushed towards the grain with mixed excitement. | Ancestral hall, barn, large lock, red flag, torch, hoe, sickle, board axe | Joy | Introduce the background and historical process of the Houtian Uprising. | Text, relief, image | Light beam |
| Expansion of red | First Exhibition Hall | The Red Army fought for land for the farmers, and everyone signed up in fear. | Hathpaxe, torch, cattail leaf fan | Excited | Open the prelude to the Houtian Uprising and introduce the character information of Chen Keruan. | Text and image, projection | Spread |
| Danger | Second Exhibition Hall | Chen Kema used a double-layer septic tank to transport supplies for the Red Army, but encountered danger halfway through. | Double-layer tank | Nervous | Red power, showcasing the talents of heroes. | Sound, light, electricity, graphics and text | Wave |
| Execution | Third Exhibition Hall | Chen Kema experienced severe torture from the enemy and was fortunate enough to be seriously injured and unconscious. | Torture equipment | Pain | Introduce the power of women in the revolution in western Fujian. | Art installations, sound, light, and electricity | Split apart |
| Healing | Fourth Exhibition Hall | After being rescued, Chen Kema recovered from her injuries and was devastated to learn of her son's sacrifice. | Bamboo huts, fish baskets, bamboo strips, military hats and uniforms | Firm | Introduction to women's movement | Text, physical objects, and scene restoration | Staggered |
| Sacrifice | Mourning Hall | Chen Kema refused to surrender to the enemy and sacrificed herself with honor. | Firewood and farming license | Fearless | Remembering the martyrs | Graphic and artistic installations | Flames |

At the meso level, the relationship between reality and virtuality in the interface design of various themed exhibition halls in the Chen Kema Memorial Hall mainly exists in two processes: one is the process of extracting two-dimensional legends (as shown in “Figure 1”) based on spatial emotions to generate various interface forms in space, and the other is the process of dividing and cutting to form surface undulating shape change features.[4] The former's relationship between reality and virtuality is manifested as the transformation of abstract emotions into spatial shapes, while the latter's relationship between

reality and virtuality is manifested as the concave convex changes in the interface, where convexity and virtuality are actually concave.

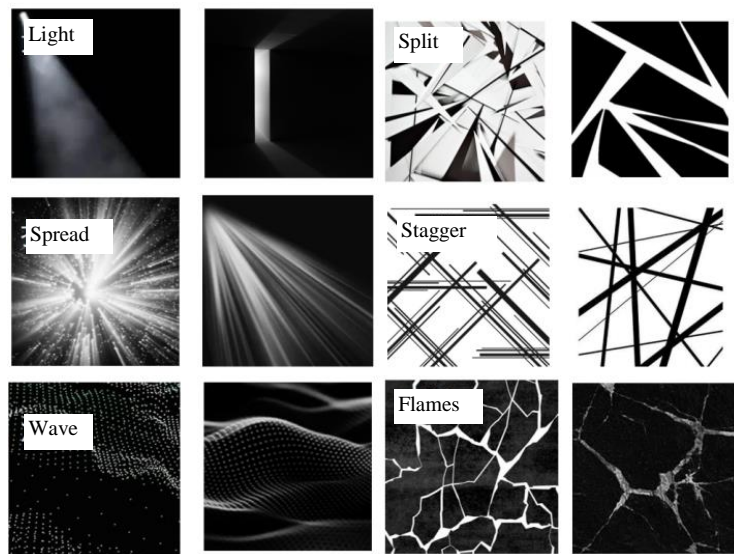


Figure 1 Two-dimensional legend. (Image source: self-drawn by the author).



Figure 2 The Third Exhibition Hall of Chen Kema Memorial Hall (Image source: self drawn by the author).

Taking the third exhibition hall of the Chen Kema Memorial Hall as an example (as shown in “Figure 2”), the third exhibition hall translates Chen Kema's painful emotions during her execution into a sharp triangular two-dimensional legend, and then divides and cuts the space's top, facade, and ground interfaces using triangles as elements to form a solid top shape and a virtual hollow display window.

At the micro level, the exhibition arrangement in the Chen Kema Memorial Hall is divided into tangible entities and virtual visible entities based on the types of exhibits. Physical exhibits are mostly represented by historical relics, photos, archives, relics, etc., while virtual exhibits are mostly represented by audiovisual videos, virtual reality, digital technology, holographic images, etc.

3.2 Colors

Colors, as one of the visual languages in display space design, bring different spatial emotions and

create different spatial moods through different color combinations. Colors have a beautifying and decorative effect visually, and can also evoke emotions such as joy, anger, sadness, and happiness psychologically. By displaying a rich and varied color world through hue, brightness, and purity, combined with changes in temperature, brightness, and depth, the relationship between virtual and real spaces can be strengthened in interior design.[5] The relationship between virtual and real colors is visually manifested as saturation. In spatial design, real colors can create a stable and realistic atmosphere. By using clear, bright, or deep colors, the space appears more solid and stable, enhancing people's understanding and comfort of the environment. Virtual colors in spatial design can create a dreamy, abstract, or surreal atmosphere, helping people enter an imaginative and creative world. By cleverly utilizing the virtual-real relationship of colors, the visual appeal and emotional expression of the space can be enhanced, making it dynamic and vibrant.

In the exhibition design of the Chen Kema Memorial Hall, spatial colors were extracted from Chen Kema's former residence located in Houtian Village, Dongxiao Town, Xinluo District, Longyan City, Fujian Province. Chen Kema's former residence is a traditional three-bedroom Zhang Sanluo large house in western Fujian. Red, ink, brown, and wood colors were extracted from the exterior walls, gates, eaves, and wooden walls as spatial colors (as shown in "Figure 3"), and the main color tone of the Chen Kema Memorial Hall was the contrast between red and gray. Red is a strong and powerful color with cultural connotations of revolution and change. Red is a

symbol of communism and socialist movements, representing the proletariat such as Chen Kema, conveying the sense of urgency of revolutionary martyrs in the Houtian Uprising and their strong fighting spirit in the process of resistance, inspiring the passion of visitors. Grey is a neutral color that lies between black and white. It has unique emotional and psychological symbolism, often conveying subtle, complex, and multi-layered emotions. The Chen Kema Memorial Hall extensively uses dark gray, which symbolizes strength and seriousness, and expresses the solemn and dignified spatial atmosphere of the memorial hall.



Figure 3 The Third Exhibition Hall of Chen Kema Memorial Hall (Image source: self drawn by the author).

In the Chen Kema Memorial Hall, the contrast between red and gray creates rich layers and dynamics in the exhibition design. Visually, red is often seen as a "real" color because it easily attracts attention, appears prominent and foreground oriented. Grey is often seen as a "virtual" color because it is softer and less likely to cause strong visual impact, making it suitable as a background or secondary element. Finding a balance between red and gray gives the space both the vitality and enthusiasm of red and the calmness and stability of gray, making the entire space rich in hierarchy.

3.3 Materials

The virtual-real relationship of materials refers to the use of contrast and interaction between different materials to create a display space with a virtual-real atmosphere. This relationship is achieved through the comparison of material textures, using different textures such as smoothness and roughness, hardness and softness to create a contrast effect between reality and virtuality in the space.

In the Chen Kema Memorial Hall, materials with a sense of realism and stability are extensively used to add practicality and comfort to the exhibition space, creating a stable atmosphere in the memorial hall space. The spatial structure, floor, and walls of the memorial hall are made of concrete material, which is a solid and stable building material that conveys a sense of solidity. This is in line with the weight of revolutionary history and the resilience of revolutionary spirit, adding an industrial style and historical feel to the space, and depicting the harsh environmental conditions of the revolutionary era. Secondly, sculptures and art installations made of stone are used in the memorial hall (as shown in "Figure 4") to increase the artistic and infectious power of the exhibition hall, conveying the power and beauty of revolutionary spirit. Stone has the characteristics of solidity and stability, adding a sense of stability and texture to the space, conveying a sense of heaviness, durability, and solemnity. In the Fourth Exhibition Hall of Chen Kema (as shown in "Figure 5"), wood is extensively used for ceiling design, booth layout, and seating arrangement, adding a natural and warm atmosphere to the space, which is in line with

the profound sense of revolutionary history and humanistic sentiment. The natural texture and texture of wood can enhance the affinity and comfort of the exhibition hall, while also showcasing the simplicity and steadfastness of the revolutionary era.

In the Chen Kema Memorial Hall, using materials with transparency, translucency, or lightness as spatial embellishments can visually

break the overly solemn atmosphere and increase the lightness and transparency. The use of glass display cabinets in the exhibition space (as shown in "Figure 5") increases the transparency and modernity of the exhibits, while also protecting them from external interference in terms of functionality. It enhances the visual lightness and modernity in form, and improves the transparency and light flow of the space.



Figure 4 Mourning Hall of Chen Kema Memorial Hall (Image source: self drawn by the author).



Figure 5 The Fourth Exhibition Hall of Chen Kema Memorial Hall (Image source: self drawn by the author).

3.4 Light

Light has strong plasticity, and the changes in its own light and shadow can create a contrast between reality and virtuality. [1] In the exhibition design of the Chen Kema Memorial Hall, the combination of light and shadow is a key means to showcase historical situations and enhance the appeal of exhibits. By changing light and shadow,

rich visual effects and emotional experiences can be created.

The use of ambient lighting and key lighting in the lighting design of the Chen Kema Memorial Hall is a combination of virtuality and reality. In the exhibition area, spotlights and high brightness lights are used as key lighting to directly illuminate important exhibits, making them the visual focus. Chen Keruan's statue or important literature

materials are highlighted through spotlights. Highlighting the details of the exhibits with high brightness lighting allows the audience to clearly see the texture and details of historical relics. Environmental lighting includes diffuse light and background light, which evenly illuminates the exhibition space through soft diffuse light, avoiding too obvious shadows and creating a comfortable viewing environment. Using low brightness background light to create an atmosphere makes the exhibits stand out in a harmonious background, and install soft background light sources on walls or ceilings.

The use of color in lighting is also crucial for creating an atmosphere, as different colored lights are used in the space to convey emotions and themes (as shown in "Figure 6"). In the Third Exhibition Hall, red lights are used to symbolize the passion and hot blood of revolution, pushing the emotions of the space to a climax. In the fourth exhibition hall, blue lights can convey calmness and reflection, immersing the entire atmosphere and gradually bringing the spatial narrative to an end.



Figure 6 Comparison of cold and warm lights in the Chen Kema Memorial Hall (Image source: self drawn by the author).

4. THE AESTHETIC VALUE OF VIRTUALITY AND REALITY

The artistic concepts of "virtuality" and "reality", including the expression systems of "using virtuality to manifest reality", "using reality to express virtuality", and "the interpromotion of virtuality and reality", are one of the excellent traditions of ancient Chinese aesthetics. [2] The aesthetic value of virtual and real art spaces enhances the depth and richness of artistic works by creating multi-level visual and emotional experiences, allowing audiences to feel more cultural connotations and philosophical reflections in the space.

4.1 *Using Virtuality to Manifest Reality: Increasing the Depth of Space and Multi-sensory Experience*

Using virtuality to manifest reality can increase the depth and layering of space, enhance the audience's perception of physical objects through various sensory experiences, and make the exhibition of the memorial hall more three-dimensional and richer. By using transparent materials, mirror effects, image projection, etc., a

seemingly infinitely extended space is created, making the actual exhibits appear more prominent in this virtual space. Through sound effects, odor devices, and tactile interaction, the audience can experience historical and cultural events through multiple senses, making the display of physical exhibits more vivid and infectious.

4.2 *Using Reality to Express Virtuality: Reproduction and Metaphor of Historical Memory*

Using reality to express virtuality can concretize abstract history and memory, helping audiences better understand and remember history. By displaying specific historical relics or photos, the audience can "touch" history and feel the real existence of the past. This concrete display method makes abstract historical events more concrete and easier to understand, thereby enhancing the audience's sense of identity and memory of history.

4.3 *Interpromotion of Virtuality and Reality: Aesthetic Effect of Combining Dynamic and Static Elements*

The interpromotion of virtuality and reality is closely related to aesthetic psychology, which is the embodiment of the concept of artistic conception and an important part of traditional Chinese thought [6]. Interpromotion of virtuality and reality can express the aesthetic effect of combining dynamic and static elements. The real part provides a stable reference point through fixed exhibits and structures, while the virtual part creates a sense of time flow and spatial variation through dynamic images, sound effects, and light and shadow changes. The combination of movement and stillness allows the audience to experience both dynamic and static dimensions of history during the visit, deepening their understanding and perception of commemorative content.

5. CONCLUSION

The "virtuality" and "reality" in traditional Chinese aesthetics are not opposed, but interdependent and transformed. Together, they form a complete artistic and philosophical system, enriching the connotation and expression of Chinese culture. The aesthetic value of virtuality and reality in the memorial hall is that through rich spatial design and emotional expression, the application of virtuality and reality deepens the presentation effect of commemorative content and enhances the emotional resonance and cultural experience of the audience, which not only improves the aesthetic value of the memorial hall, but also achieves the transmission of history, culture, and emotions.

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