

Research on the Application of Holographic Images in Public Spaces of Children's Hospitals

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Abstract: As a cutting-edge field, holographic imaging has developed rapidly. It is widely used in stage performances, commercial displays, and other aspects. While enriching the visual language of contemporary art and design, it also reflects its widespread application value. From the perspective of children's psychological healing, innovative research methods are used to provide new design applications for the art design of public spaces in children's hospitals through holographic imaging technology, and to contribute development ideas to design innovation in this field. With the rapid development of China's society and economy, as well as the opening up of national population policies, the healthy growth of young children is increasingly receiving widespread attention. As a special group, children involve various aspects such as society, culture, education, psychology, etc. The integration of art into children's medical environment forms an important part of modern hospital design, which directly affects the rehabilitation effect of children and the medical level of the hospital. This article focuses on conducting in-depth healing research by combining the physical and mental characteristics, cognition, and contemporary aesthetic language of children. Under the support of children's psychology theory, explore the new application of holographic imaging technology in children's hospital space. Apply holographic stage technology to the innovative design of children's activity centers in children's hospitals. Utilize holographic stage cartoon images to enhance emotional communication and interaction among children, create a space for artistic healing, inject cultural connotations into children's hospitals, and achieve the goal of happy medical treatment for children. Extract design concepts and overall solutions for interactive experience, spatial environment, artistic healing, emotional care, and other aspects. Through innovative digital media art design, a new application experience has been formed in medical space art, media and other designs, optimizing children's medical spaces, and providing useful reference and reference for the development of children's medical design and digital media art design in China.

Keywords: Holographic imaging, Children's Hospital, Public spaces, Interactive experience, Art healing.

1. Current Research Status at Home and Abroad

1.1. Current Status of Holographic Image Application

Long ago, relevant scholars began to study and analyze holographic imaging technology. After a long period of research, I have finally mastered the technology of photography and production, and have the production ability based on holographic imaging technology. [1] But in China, the most frequently used and most effective ones are in stage performances, sports opening and closing ceremonies, and

commercial advertisements. On a technical level, due to insufficient promotion efforts, high cost, cumbersome technical means, and limited equipment, domestic support mainly relies on foreign technical support and artistic creation. At present, many developed countries abroad have invested in the research of holographic imaging, expanding a large number of technological applications from indoor to outdoor. This not only expands the spatial imagination ability in the field of art and design, but also enriches human vision and creativity.

1.2. The current situation of public spaces in children's hospitals

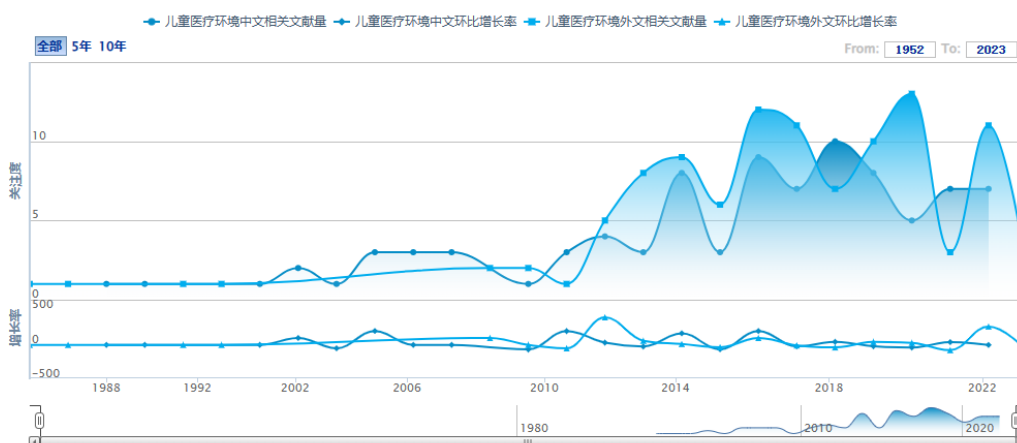


Figure 1. User Attention Trend chart of "Children's Medical Environment" from 1987 to 2023 (Photo source: CNKI)

Most children's hospitals in our country lack in-depth exploration of children's psychological characteristics in public space design, and only use patterns and colors to add childlike charm, reflecting the difference from comprehensive hospitals. Currently, there are few books on the design of public spaces in children's hospitals, but some scholars have conducted research on the design of public spaces in children's hospitals.

From the index analysis results of searching for "Children's Medical Environment" on CNKI (as shown in Figure 1.1), it is clear that the number of relevant literature on children's medical environment has been gradually increasing from 1987 to 2023, and CNKI users' attention to children's medical environment is also increasing.

Overall, research on the design of public spaces for children's hospitals in China is still in the exploratory stage. Most children's hospital public space environments still lack systematic, independent, and professional guidance, and have not fully utilized the expertise of children's hospitals according to local conditions, greatly weakening the effectiveness of children's medical care.

As Guy Debo said, "The accumulation of capital expands capital to the surrounding areas in the form of perceptual objects." [1]According to Guidelbo's theory of emotional form, through the presentation of holographic imaging technology, patients and children can no longer be forced to accept certain information, but actively capture it. This process of capture is an individual's emotional behavior, while also allowing capital to accumulate. In the context of the digital media era, the rational application of holographic imaging technology in children's medical spaces can promote the superposition and mutual supplementation of sensory information in children, eliminate the exclusion of children from unfamiliar environments in hospitals. Through this superposition, it is inevitably better than the visual interpretation of traditional images, effectively alleviate children's fear of hospitals, meet their psychological needs, and elevate them to an artistic healing atmosphere, An artistic space that immerses children in immersive experiences.[2] The combination of holographic imaging technology in the public space of children's hospitals is a highly comprehensive research that integrates the psychology of patients and children, the public space environment, visual interaction, and holographic imaging technology. It also involves multiple coordinated considerations of sound, light, circuit, physics, and background environment, and is a multi-dimensional manifestation of spatial art form. The perception of patients and children is not only based on their five senses, but also elevated through a series of interactive analysis and thinking to enhance their understanding of hospital spatial culture.

Holographic images can be used to bring patients and children into a virtual reality environment through sensor devices, and the behavior and actions of the children's reactions are achieved through their subjective reactions. The interactive actions generated by entering the holographic stage, in a sense, are the perception and response of the child to the holographic image, which will affect and drive the child to continuously exhibit new interactive behaviors. During this process, a large amount of information is constantly stimulated and interacted through visual, auditory, and other stimuli in the system calculation, satisfying the children's desire to manipulate space and continuously spreading through interaction. Breaking the children's inherent

understanding of the children's hospital environment, thus transforming into new ideas and concepts. The medical space of a children's hospital is to provide a physical and mental pleasure, comfort, warmth, and safety medical environment for patients, children, and their families, in order to achieve the goals of healing, nursing, and rehabilitation. As an emerging digital media technology, holographic imaging can be applied to the medical space of children's hospitals, breaking the limitations of traditional one-way communication in children's hospitals and starting to shift towards humanized two-way interaction development. Children are no longer forced to receive information but actively participate. Therefore, the following application values are summarized and summarized:

2. The Application Value of Holographic Images in Public Spaces of Children's Hospitals

2.1. Can meet the physical and mental health needs of children

Children who stay in the hospital for a long time are prone to develop negative emotions such as boredom, anxiety, and fear, which affect the effectiveness of treatment and rehabilitation. The image image of holographic imaging has the characteristics of three-dimensional and interactive, which can attract the attention and interest of children, provide multiple sensory stimuli, improve emotional value, and alleviate discomfort. The use of colorful and interesting three-dimensional images can create a joyful, relaxed and lively atmosphere, enhance the joy of life for children, and be beneficial for restoring physical and mental health. Due to prolonged bedridden and sedentary periods, patients and children can easily experience muscle atrophy, joint stiffness, and poor blood circulation. Holographic imaging can provide diverse sensory stimuli and interactive experiences, actively guide children to engage in appropriate physical activities, promote physical development, effectively prevent and improve various functional impairments, and at the same time, promote healthy physical and mental growth.

2.2. Can meet the quality of medical services for pediatric patients

The application of holographic imaging in medical spaces can add color and fun to the hospital environment, breaking the monotony and dullness of traditional medical environments, increasing the pleasure and satisfaction of children and their families, and improving the overall quality of medical services. In diagnosis, doctors can use holographic projection to simulate the operation process, providing doctors with a more realistic and intuitive demonstration of the operation. Projection of three-dimensional images into the air can not only help doctors analyze the condition, improve surgical skills and safety, but also reduce the risk of surgery. Assisting medical diagnosis not only improves diagnostic accuracy and treatment effectiveness, but also brings innovation and convenience to the medical process.

2.3. Can promote the development of children's social skills

The interactivity and diversity of holographic images can provide a broader social platform for patients and children,

attract their ability to communicate and cooperate with each other, enhance their social skills and teamwork spirit, stimulate their curiosity and imagination, and cultivate their creative thinking and exploratory spirit. Provide children with a rich and vivid learning experience, help them understand knowledge more deeply, and enhance their interest and ability in learning.

2.4. Can promote the sustainable development of children's hospitals

The use of holographic imaging in children's medical spaces can add a unique charm to children's hospitals, improve their hospital image and visibility, increase the satisfaction of children and their families, and drive the sustainable development of the hospital's medical industry. Compared with traditional lighting equipment and technologies, holographic images do not require a large amount of electricity and energy consumption during the projection process, and have lower energy consumption and environmental pollution. As a cutting-edge emerging technology application, the adoption of children's hospitals will promote innovation and application of digital media technology, improve the hospital's medical services and technological level, and enhance the sustainable competitiveness of children's hospitals. The design of a children's hospital is to improve the comfort and healing effect of patients and children in the hospital, so that they can feel more care and warmth during the treatment process. Therefore, children's hospitals need to constantly update and improve innovative designs to meet the needs of different children.

The design of public spaces in children's hospitals should focus on patients and children as the main audience group, with a focus on creating an optimistic and joyful atmosphere. Patients and children who stay in the same place in the hospital for a long time can easily become bored and uneasy. To alleviate this situation, the design of public spaces should be full of childlike charm. Including medical treatment areas, rest areas, game areas, etc., providing patients and children with more space to choose activities. During the process of hospital treatment, patients and children often feel lonely and helpless. The concept is to create spaces that encourage interaction and social diversity, allowing patients and children to feel warmth both physically and mentally, and helping to alleviate the tension and pressure caused by patients and children in the hospital environment. The design principles should comply with the following:

3. Design Strategy of Holographic Images in Public Spaces of Children's Hospitals

3.1. Emphasize spatial functional design

By using holographic image design to improve the knowledge level and interests of children, create a favorable treatment environment, provide educational and entertainment functions, and help children alleviate tension and pain. Increase the adaptability of the space, thereby improving the sense of pleasure and comfort. After determining the function and nature of the space, it is necessary to plan the space reasonably to achieve the best use

effect. The design requires the use of design elements such as plane layout, color design, lighting design, and material application that conform to the space's function and nature. At the same time, attention should be paid to dynamic, rhythmic, and serialized display methods, and different elements should be reasonably matched.

3.2. Design with emphasis on comfort and healing effects

When designing public spaces for children's hospitals, it is necessary to pay attention to hardware facilities and software construction, providing psychological attention and comprehensive services for patients and children. The design of public spaces within hospitals not only improves the comfort of patients and children, but also has a positive impact on their psychological healing. Therefore, by designing different scenarios, such as multiplayer interactive games and emotional interaction scenarios, we encourage communication between children, create a satisfactory healing environment for children, and promote rehabilitation outcomes.

3.3. Design that conforms to the psychological specificity of children

In the process of treating pediatric patients, we must follow the principle of psychological specificity of patients and children, and adopt corresponding psychological intervention methods to help patients and children recover better. The design should serve the children, cater to their activities and behavior, reflect the basic design concept of human care, and further deepen the design content.

The physical and mental development of children is characterized by stages, dynamics, wholeness, and individual differences. During the treatment process, patients and children often feel emotions such as fear, anxiety, and loss. Using games, music, heart to heart talks, stories, and other methods can alleviate pain and anxiety, thereby enhancing confidence. At the same time, we can use methods such as situational reconstruction and behavioral therapy to help patients and children understand the causes and treatment methods of the disease, actively participate in the treatment process, and improve their subjective initiative in treatment. Based on meeting the needs and emotional experiences of patients and children, we fully utilize color and pattern changes, dynamic forms, sound effects, and space to enhance attractiveness. In addition to innovative materials, structures, and functions, we integrate children's hospitals into emotional care design,[3]Make patients and children feel comfortable and joyful in the hospital, and bring more surprises and fun to patients and children.

References

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