

# The Interactive Spatial Aesthetics between Holographic Display Technology and Dancing Body Language <sup>†</sup>

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**Abstract:** The emergence of holographic stage art has made the concrete space of the dance theater fragmented, the virtuality and multiplicity place the dancers' performances in a kind of phantom space beyond the object. In this kind of cross-border cooperation of visual arts, a new interactive space is formed between dancers and audiences, dancers and holographic images, and audiences and holographic images. This paper believes that there are three types of interaction modes in the holographic dance theater. The first is the interaction between technology and the body, the second is the interaction between technology and space, and the third is the interaction between technology and emotion. Among the three interactions, the interaction between technology and emotion is the developmental direction of the holographic dance theater in the future. The beauty presented by dance art is the unique beauty of human life organisms. The new media tools should extend the senses of dance and inject new cultural attitudes and aesthetic interests into the development of dance.

**Keywords:** holographic display technology; dance; interaction



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## 1. Introduction

Different from the creation background of the physical beauty and rhyme beauty in traditional dance body theater art, the contemporary dance theater in the 21st century has grown up in the post-modern artistic trend and a wave of media change. On the one hand, the theater equality and formal aesthetics emphasized by post-modern art have enabled the creation of contemporary dance to the development direction of body deconstruction; on the other hand, the continuous transformation of the media system means that the visual art of dance has gained a new way of exploration from video technologies such as television, the Internet, and virtual images. The birth of holographic imaging technology have made technology and art form a powerful synergy, and promoted the dance theater to become a visual cross-border creative drawing board. The leading role of choreographers in the creation of works has also been challenged. The roles of planners, media engineers, and visual designers have gradually been emphasized from behind the scenes of traditional theaters to the front stage.

Dance is the dynamic visual art, using the human body as the material carrier and the body movements as the language to regularly occupy time and space. The abstract features of the dance movement language establish a complete visual image system full of continuous changes [1]. It uses body language to explore and express people's cognition of internal and external time and space. Therefore, in traditional dance theaters, the dancers' body performance is the core aesthetic focus. However, the dramatic changes of contemporary media technology have continuously innovated the stage art, and the aesthetic focus of theater art has gradually blurred. The emergence of holographic stage art has made the concrete space of the dance theater fragmented, and the virtuality and pluralistic characteristics place the dancers' performances in a phantom space beyond the

physical space. In the cross-border cooperation of visual arts, a new interactive space is formed between dancers and audiences, dancers and holographic images, and audiences and holographic images.

## 2. The Physical Interaction of Holographic Dance

“Interaction” generally refers to the exchange of information between humans and all external things in nature. “Interaction” is multidimensional and superimposed, and is the active participation of both parties of information. Starkey Duncan regards interaction as a state in which both parties of information are aware of each other’s existence [2,3] (p. 269, p. 7). The meaning and beauty conveyed by body language in traditional dance theater are often one-way, while that which the holographic dance theater constructs is a multiple and interactive experience space. This interactive space is constantly reorganized and redefined during the performance, and the artistic effects it produces are relative, instantaneous and free.

In 2015, Fuse Studio released the holographic interactive performance work “AUREA”. This work is projected in real time by two screens, the research team configured two motion sensors for the dancers to analyze the movements: one analyzes the movement of the dancer touching the screen in front of the dancer, and the other analyzes the movement behind the dancer. The research team developed a software in openFrameworks to analyze data from mobile sensors and audio streams. The software presents various particle systems in real time by calculating the data of shaders: such as visual feedback of hands, particles in “space”, the specific three-dimensional geometric shapes generated, etc. During the performance, the dancers can fully interact with the visual form generated by the holographic image while free dancing. For example, the dancer’s arm can directly control the movement, rotation, and switching of the three-dimensional image; the dancers can traverse and squeeze the geometric shapes. The dancers are like messengers of the god endowed with magic, manipulating the visual forms around the body. It can be seen that the stage art equipped with the holographic technology breaks the limitations of physical space visually. The trajectory of the dancer’s body movement in the space, such as squeezing, occupying and flowing in the space, has been visualized. This presentation enriches the sensory experience of the audience when they appreciate the dance performances. At the same time, visual designers must adhere to the principle of broadening the audience’s sensory experience when creating stage images. Therefore, the holographic dance theater will produce a triple interactive space (dancers, holographic images, and audience), which reflects the further development of technical intelligence aesthetics.

## 3. The Spatial Interaction of Holographic Dance

The interactive multitouch realized by holographic display technology not only broadens the audience’s visual and auditory sensory capabilities, but also opens up a new virtual data channel for dance creation. When the professional dancers try their best to cooperate with the media system, they dance like young children when they first learned to run and jump, although the form is simple, they do not have to be limited by the material, and they do not have to be burdened by the expression of meaning. Nowadays, when dance creation is surrounded by various rights, meanings, doctrines and authoritative aesthetics, what holographic display technology triggers is not an established aesthetic form, but to create a new free channel and new tool for choreographers.

For example, at the BMW 7-series sedan launch event, Sila Sveta, a well-known event company, combined dance with cutting-edge holographic display technology to present a visually immersive interactive dance show. The dancers on the stage can easily rotate the “stars” around them with their hands, draw a three-dimensional planet in the air, jump into the air and hover as a real three-dimensional image, fall into the “underwater” to swim, throw their clothes down and hover in the air... These actions, as in sci-fi movies, are completed with the interaction of technology and art, immersing the audience in an unrealistic dream space and giving a feast for the senses. The emergence of holographic

display technology has given choreographers a more urgent task than exploring body language, that is, the difficulty of the creative possibility and how to effect implementation of each level of this new technology. It is foreseeable that holographic dance art is a new track in the development of contemporary dance art.

#### 4. The Emotional Interaction of Holographic Dance

Although many dance creators and theoretical researchers have expressed doubts and worries about the creative path relying on technology, they believe that holographic dance may obscure the dominant position of body language, and the body characteristics of dance may be buried by the theater of egalitarianism. However, the author believes that the significance of “interaction” in dance should be carefully considered. The powerful interactivity of holographic dance art is based on the experience of body language, not on the exchange of information. In short, we should agree with the idea that the future holographic dance theater should not be reduced to the slaves of visual sensory pleasure. The interactive holographic dance theater should be 3 different from the general holographic three-dimensional static image display, and also different from the sensory enjoyment brought by simple visual crossover. It should be a deep interaction of emotional experience.

As a portrait art of the human soul, the dance art constructs the connection between body and space, movement and language by emotion. In the expression of art, the interaction between people and the external world, society, and living environment should be guided by spiritual needs. Holographic technology provides a broader and more free emotional release channel for dance creation, rather than a media dazzling tool for stimulating eyeballs. In this perspective, the advertising film shot by the famous Italian ballet artist Alessandra Ferri and the British company Boots has more emotional interaction depth. The technical support of this commercial comes from Musion3D, one of the world’s leading hologram companies. The technical team extracted the dance video of “Juliet” played by Ferri at the age of 19 into a three-dimensional holographic image, allowing the 52-year-old Ferri to “meet” with the 19-year-old “herself” in the same time and space [4]. Two Ferris danced together. At the age of 19, her dance appeared youthful and innocent. At the age of 52, her movements precipitated the grace and calmness that the years have baptized. They dance and interact from time to time. At the end of the dance, the elderly Ferri spins towards the 19-year-old Ferri who is gradually dissipating... The use of emotional symbols in this work is precise and profound, and the complex emotions under time and space encounters are presented so vividly that the audience ignore the novelty of technology, they are completely immersed in the space of deep emotional experience constructed by the force of technology and art.

#### 5. Conclusions

All in all, if the dance creator attempts to completely rely on technology to explore the body language performance of dance, it is tantamount to giving up the interaction and thinking of people with oneself and the external world, and it will inevitably become a tool for showcasing the skills of the new media system. The interdependence and symbiosis between art and technology are based on the construction of human spiritual thinking. The beauty presented by dance art is the unique beauty of human life organisms. The new medium tool should extend the ability of dance senses, and inject a new cultural attitude and aesthetic interest into the development of dance. Nowadays, in the context of the reality that art is increasingly being created between electrons, photons and living organisms, the distance between technology and art is also constantly shortening, we can expect that the future holographic era will be a new aesthetic era created by artists and scientists.

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