

Research on tactile sensory aesthetics in visual communication design in the new media environment

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ABSTRACT

Based on the theoretical foundation of tactile perception, this article focuses on the application path of tactile perception in visual communication design in the context of new media. By sorting out the mechanism of tactile perception in visual design, extracting the basic principles of tactile perception design, and elaborating specific design methods from the dimensions of physiology, psychology, and virtual tactile perception, we strive to provide theoretical references and practical guidance for the multi sensory expansion of visual communication in the new media era. The purpose of this study is to raise designers' awareness of the dimension of tactile perception, stimulate innovative ideas in tactile design, and promote the upgrading and transformation of visual communication from flat to three-dimensional, in order to bring users a more authentic, natural, and immersive communication experience.

KEYWORDS

new media; Visual Communication Design; Tactile sensation; aesthetic research

Tactile perception, as an important dimension of human perception of the world, has always played an indispensable role in visual communication design. With the rapid development of new media technology, new features such as digitization, virtualization, and intelligence have opened up vast space for the application of tactile perception in visual design. How to creatively apply tactile perception in the new media environment, expand the expressive power of visual communication, and create immersive and personalized user experience has become an urgent topic for design research and practice to explore.

1 Overview of tactile sensory aesthetics in the new media environment

The development of new media technology is profoundly influencing the way people perceive the world. In the field of visual communication design, tactile sensory aesthetics are increasingly receiving attention. As an important channel for human cognitive environment, touch can provide rich and authentic texture experiences, becoming an important supplement to visual design. In the context of new media, tactile sensory aesthetics exhibit several significant characteristics: Multi sensory interactive experience. New media technology breaks the isolation of sensory experience, promotes the integration of multiple senses such as vision, hearing, and touch, and creates an immersive and interactive communication atmosphere. Tactile perception is no longer an isolated existence, but collaborates with other senses to shape aesthetic perception. Digital tactile presentation. The development of digital technology has made it possible to simulate and reproduce tactile textures. Through precise characterization of material textures and real-time interaction of tactile feedback, digital media provides users with a realistic tactile experience, bringing people closer to information.

Personalized tactile customization. In the era of new media, tactile sensory aesthetics are showing a trend towards personalization and customization. By relying on big data analysis, designers can accurately grasp users' tactile preferences, provide customized tactile experiences, and meet differentiated aesthetic needs. Expansion of virtual tactile perception. Virtual reality, augmented reality and other technologies introduce tactile perception into the virtual world, breaking the limitations of physical space. Users use digital avatars to perceive touch in virtual scenes, gaining immersion and immersion beyond reality, and expanding their tactile imagination infinitely. Faced with the new trend of tactile sensory aesthetics, visual communication design must keep pace with the times and actively embrace the tactile revolution.

2 Principles of tactile perception design in visual communication design in the new media environment

2.1 Principle of coordination

The tactile perception design in visual communication should not exist independently, but should form a harmonious and unified whole with other senses. Designers need to comprehensively consider the complementarity and resonance

between tactile elements and visual, auditory, etc., striving to create a coordinated multi sensory experience. For example, in interface design, tactile feedback should complement the visual style and be combined with sound prompts to create a unified atmosphere. For example, in brand design, the choice of tactile texture should be in line with the brand's visual identity, jointly shaping a consistent brand image. Only by integrating multiple senses can tactile perception design truly play its role and enhance the infectiousness of communication.

2.2 Principle of Interactivity

In the context of new media, tactile perception design should focus on human-computer interaction experience and emphasize user centeredness. Designers need to take the user's perspective and provide convenient, comfortable, and enjoyable tactile feedback based on their perceptual habits and interactive psychology. This requires tactile perception design not only to simulate realistic tactile sensations, but also to provide appropriate tactile prompts and guidance in the interactive process at the appropriate time. For example, moderate vibration feedback can enhance the user's sense of operation when operating on a touch interface, while in virtual reality scenes, force feedback devices can provide an immersive tactile experience.

2.3 Principle of Applicability

Tactile perception design needs to be closely integrated with communication scenarios and demands, imitating nature and using tactile elements appropriately. Designers should fully consider the characteristics of the medium, choose appropriate tactile analogies, and avoid excessive design that is far fetched. For example, in printing posters, using textured paper, embossing, etc. can enhance the visual realism; In the display of e-commerce products, the fine depiction of material textures can guide users to imagine the real touch and enhance their purchasing desire. However, for some complex and abstract information communication, excessive emphasis on tactile simulation may backfire.

2.4 Principle of Differentiation

The physiological conditions, cultural backgrounds, and tactile preferences of the audience are different, and tactile perception design should respect these differences and provide personalized experiences. Designers should conduct user research to gain a deep understanding of the tactile demands of the target audience, and then match corresponding design strategies. For example, for children, soft, rounded, and safe tactile materials can be selected for design; For adult users, personalized tactile customization can be provided based on their occupation, interests, and other characteristics. For example, the connotations and preferences of tactile elements vary greatly in different cultural backgrounds. Therefore, tactile design in cross-cultural communication needs to be carefully considered to avoid misinterpretation of tactile metaphors.

3 Tactile Perception Design Method in Visual Communication Design in the New Media Environment

3.1 Design method based on physiological tactile perception

The design method based on physiological tactile perception emphasizes the use of digital technology and intelligent materials to simulate real tactile sensations and enhance the immersion of visual communication. This method aims to infuse tactile experience into various aspects of visual design, providing audiences with a more three-dimensional and authentic sensory experience through the comprehensive application of multiple senses. Reasonable use of this method can expand the dimensions of visual expression, enhance the infectivity and persuasiveness of information dissemination, and open up new possibilities for tactile perception design in the era of new media. Specifically, design methods based on physiological tactile perception include the following aspects:

Designers can use digital tools such as 3D modeling and material rendering to finely depict the tactile characteristics of different materials, such as the cold texture of metal and the warm texture of wood. Through realistic visual presentation, they can create a sense of immersion for the audience. At the same time, designers can also use rapid prototyping technologies such as 3D printing and laser engraving to transform digital tactile models into tangible tactile samples, allowing audiences to obtain tactile sensations that are extremely similar to real materials through direct touch, deepening their understanding and memory of the conveyed information. In addition, designers can also apply interactive technologies such as force feedback and vibration feedback to create multi-dimensional tactile perception, such as using the vibration feedback of touch screens to simulate the tactile sensation of physical buttons, or using force feedback devices to allow users to feel real touch and grip in virtual reality scenes. Furthermore, designers can integrate multi sensory stimuli such as dynamic light and shadow, airflow pressure, etc. into tactile design to create a tactile

synesthesia effect. For example, by utilizing the changes in light and shadow to enhance the texture differences of materials, or by adjusting airflow pressure to create tactile imagery such as lightness and heaviness, designers can fully penetrate the audience's tactile imagination and bring a more fulfilling sensory experience.

3.2 Design method based on psychological tactile perception

The design method based on psychological tactile perception focuses on the emotional reactions and cognitive associations triggered by tactile experience, aiming to evoke emotional resonance in the audience, strengthen the conveyed theme, and expand the design semantic space through the metaphorical use of tactile elements and situational shaping. This design method is based on human psychological needs and cognitive laws, striving to integrate emotional factors into tactile perception, create meaningful tactile images, and enhance the infectivity and persuasiveness of visual communication.

For example, in brand design, designers can delve into the emotional connection between brand connotation and tactile elements, choose tactile materials that match the brand personality, and shape a distinct brand tactile image. For example, for a brand that advocates environmental protection, designers can use simple materials such as recycled paper and natural fabrics to convey the brand's green values through their rough and primitive touch, triggering emotional recognition from the audience. For example, in the design of public service advertisements, designers can cleverly use tactile metaphors to compare the plight of poverty with rough and cold tactile sensations, and symbolize love and hope with warm and soft tactile sensations. Through tactile comparison, empathy can be aroused in the audience, and public goodwill and action can be aroused. For example, in the design of cultural and creative products, designers can extract tactile imagery from cultural symbols and historical memories, use concrete tactile design to connect cultural connotations, and awaken people's collective memory. Designers can also incorporate the texture of traditional architecture's bricks and tiles, as well as the fabric texture of classic clothing, into product tactile design to express cultural heritage in the form of touch, triggering people's nostalgia and cultural pride.

3.3 Design method based on virtual tactile perception

The design method based on virtual tactile perception utilizes digital interaction technology to create an immersive and multi-dimensional tactile experience, expanding the perceptual dimensions of visual communication. This method utilizes new media technologies such as virtual reality and augmented reality to break the limitations of physical space and create a tactile perception environment that integrates reality and virtuality, allowing the audience to interact with digital information in a more realistic and natural way, thereby enhancing the sense of immersion and participation in visual communication.

For example, designers can use VR/AR technology to create immersive virtual tactile scenes, allowing the audience to obtain realistic tactile feedback in the virtual space by wearing specialized equipment such as data gloves, tactile vests, etc., such as feeling the shape, weight, temperature, etc. of virtual objects, thus fully immersing themselves in the tactile atmosphere created by the design [7]. At the same time, designers can also develop motion gamified interactive applications, using motion sensing devices to capture the audience's body movements and convert them into virtual tactile feedback, allowing the audience to obtain real-time tactile responses through natural body interaction, such as feeling the touch of wind by waving their arms, feeling the touch of different materials by stepping on the ground, etc., thereby enhancing the realism and entertainment of the interactive experience. In addition, designers can incorporate virtual tactile elements into touch interface design, using tactile simulation technology to simulate tactile effects of different materials and shapes, and combining interactive mechanisms such as vibration and force feedback to give touch operations a realistic tactile texture, enhancing the naturalness and immersion of human-computer interaction.

4 Conclusion

In summary, whether from the perspectives of physiology, psychology, or virtual tactile perception, tactile design can inject new vitality into visual communication, bringing a more three-dimensional, immersive, and personalized communication experience. This discovery has opened up the sensory realm of visual communication and provided new possibilities for design practice. Looking ahead to the future, the application prospects of tactile perception design in new media visual communication are broad. On the one hand, with the development of cutting-edge technologies such as artificial intelligence and big data, tactile design is expected to achieve more intelligent and personalized interactive experiences. Machine learning algorithms can accurately capture user preferences and generate personalized tactile feedback in real-time; Biometric technology can convert users' physiological signals into tactile interactions, achieving empathetic design based on touch.

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