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Research on the Emotional Design of Interactive Interface Dynamics

Chun Shu

Guangzhou Xinhua University, Guangzhou 510520, Guangdong, China.

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***Corresponding author:** Chun Shu, Guangzhou Xinhua University, Guangzhou 510520, Guangdong, China.

Abstract

In today's information age, the interactive interface has become the most important medium for the interaction between human beings and digital products. Kinetic effect is an important dynamic factor that influences the visual effect of interactive interface, which not only has a functional role, but also has an impact on the psychological and emotional experience of users. The purpose of emotional design is to create products that can trigger the emotional resonance of users, so it is particularly important to integrate the concepts of emotional design into the design of kinetic effects of interactive interfaces. This paper firstly introduces the concept and role of interactive interface kinetic design, and tries to analyze the emotional design strategy of interactive interface kinetic effect from different levels, such as instinctive layer, behavioral layer, and reflection layer, and discusses the design method of interactive interface kinetic effect from the level of emotional design.

Keywords

Interactive interface; dynamic effect design; emotional design

Introduction

With the rapid development of new media technology, the traditional static graphic interactive interface can no longer meet the diversified needs of modern users for interactive experience. In order to provide a richer, more vivid, and more emotional interactive experience, dynamic effect design has become an indispensable part of interactive interface design. Through the dynamic visual effects, the dynamic effect design makes the interaction interface more dynamic, and the interaction with users is more natural and smoother. This design method not only improves the user experience, but also provides more possibilities for emotional design. Integrating the emotional design concept into the dynamic design of the interactive interface endows the interactive interface with more abundant emotional expression, which can better meet the aesthetic needs of users, and also makes the product more humanized.

1. The basic concept of the dynamic effect design of the interaction interface

The history of dynamic design can be traced back to the middle of the last century, but there is no clear and unified concept. Dynamic effect design is often used in the film and TV opening section, dynamic font, and so on. Against the background of the continuous development of new media technology, the dynamic efficiency design has been widely used in the interface design of mobile devices. The dynamic efficiency design discussed in this paper is the design of an interactive interface as the carrier. Dynamic effect design is an artistic form of expression that combines static graphic design and animation technology organically to provide functional services for products (Li & Gao, 2022). There are great differences in animation design, GIF production method, and display effect. The biggest difference between dynamic effect and animation is audio-visual language, story plot, and functionality, etc. That is to

say, compared with animation, it emphasizes more functionality, and can only focus on the integration of visual effect and function without the help of lens language and plot. GIF appears in the form of dynamic graphics files, so the concept of GIF is relatively broad. It can refer to both photography and hand-drawn pictures combined in sequence frames to form dynamic effects, and can also simply transform some elements in the picture to achieve the purpose of dynamic effect, which is generally used for circular playback in emojis and article pictures. Compared with the dynamic design, the biggest difference is still in the function and application scenarios.

2. Function and characteristics of dynamic effect design

The interactive interface design changes from physimorphic to flattening, and the concrete graphics are lost in details, materials, and light efficiency. At this time, the application of dynamic effects can make up for the flattening and monotonous abstract design style. The dynamic effect not only simulates the texture of the real object during the interaction, but also makes the visual presentation mode more distinct, which improves the sense of use and experience. Dynamic design always adheres to the principle of "user-oriented", through unique visual effects and dynamic performance, can effectively attract users' attention, and provide them with a better service experience. This design method not only focuses on the needs and feelings of users, but also focuses on meeting their expectations and improving the satisfaction of their interactive experience (Feng & Huo, 2023).

2.1 Interactivity and ease of use

Dynamic effect design has an important auxiliary function in constructing hierarchical relationships, clarifying the running state, and realizing information feedback. For example, in the interface of password input, in the case of incorrect user password input, using the password input box jitter, mobile phone vibration, and other information, so as to give the user intuitive and clear feedback information, and timely notify the user of the wrong input information. The design avoids the confusion caused by the insufficient feedback results, which can improve the user experience and make the interactive interface more friendly and easy to use.

2.2 Visualization of the interaction behavior

The visualization of interaction behavior can be achieved by integrating dynamic effect design into interactive behavior. Compared to the traditional boring program instruction display, this design method provides the user with a brand new visual experience. Even if there is no simulated style design, the animation effect can also bring the user to a specific situation. Take the pop-up effect of buttons and dialog boxes as an example, the attractiveness and interactivity of the interface can be enhanced by adding appropriate dynamic design, such as gradient, zoom, or sliding. When turning the page, through sliding, switching, dynamic effects, and data scrolling, it can bring a strong visual impact to users, enrich their sensory experience, and also meet their aesthetic needs.

2.3 An immersive sense of experience

Dynamic design can bring the product immersion and enhance the experience. Humans are good at recalling the details of various experiences, intellectual or emotional. Through the design of dynamic effects, stimulating the emotional response of users can enhance the "immersion" feeling during direct operation. The immersive dynamic design with emotion transfer as the core helps to bring the user into the flow experience and promote the emotional connection between the product and the user. On the flat design interface, the deformation and movement of the elements add the time dimension and show the spatial depth relationship. Dynamic effect design is to show the role of gravity, elasticity, and tension through the simulation of the motion law of objects in the real world, so as to give users a comfortable psychological feeling. In addition, the dynamic identification of some products also expresses the emotional orientation of users, and further enhances the user experience (Liu, 2017).

3. The emotional design mode of interactive interface dynamic effect

Emotional design is a design method designed to trigger the positive emotional response of users. Its main purpose is to make users have a positive emotional experience, such as pleasure and trust when using the goods, so as to enhance their satisfaction and loyalty to the goods. The most important significance of emotional design is to pay

attention to the functionality and practicality of products, but also pay attention to the emotional needs and psychological feelings of users.

The concept of emotional design was first proposed by American cognitive psychologist Donald A. Norman in his book The Psychology of Design. In Norman's view, design meets three different levels: instinctive, behavioral, and reflective. The instinct layer pays attention to the appearance and feel of the product, that is, the first impression and intuitive feeling of the product; the behavior layer mainly studies the product function and ease of use, that is, the feeling and result of the product; the reflection layer focuses on the role of the product in the self-image, personal value and story background, that is, the deep psychological feeling and social value that the product brings to the user.

3.1 The emotional and dynamic effect design of the instinct layer

In the emotional effects, the visual factors predominate. Emotional design affects users' visual experience by triggering their emotional responses. The principle of visual design is to guide the user's sight flow and enhance the coherence and smoothness of the user experience by rationally using the form changes and mutual comparison of the interface elements. Morphological changes are a key factor affecting the visual effects. Through the rational use of basic attributes such as displacement, rotation, scaling, and gradient, the interface elements can present a dynamic sense of beauty and hierarchy. These changes can quickly attract users' attention, guide their sight flow, and help users to better understand and use the product.

In visual design, it is very important to use dynamic effects in moderation. Dynamic can enhance the vividness and interactivity of the interface, but too much may interfere with users' acquisition of content and affect their sight flow (Zhang & Jiang, 2024). Therefore, designers need to carefully weigh the use of action to ensure that it is appropriate and does not interfere with the user's attention. By comparing the dimensions of time, space, color, form, and texture, designers can better guide the user's sight flow. For example, the dynamic visual effect can be created by comparing the time dimension, duration, and timing; the spatial amplitude and path comparison can create the level and stereo sense; the color contrast and the texture contrast enhance the visual touch and authenticity. Through the comparison of the above elements, designers can build a logical hierarchy of content to further enhance the user's perception and understanding of the interface elements. For example, using the comparison of color, form, and texture dimensions, the interface elements can be classified according to their importance and hierarchy, making the information clearer.

3.2 Emotional and dynamic effect design of the behavioral layer

When the visual factors of the instinctive layer dominate, the user's cognition will focus on the ease of function, which is what the behavioral layer calls utility. According to the four aspects of the design of excellent behavior level summarized by Professor Norman, we can conclude the following principles (Wang, 2021):

3.2.1 Functionality

Functionality is one of the basic requirements of animation, which aims to provide services to achieve a specific purpose or goal. In interaction design, the functionality of dynamic activity is reflected in multiple aspects. First of all, through the reasonable application of dynamic effects, designers can clearly show the hierarchical relationship between the various elements of the interface, so that users can have a more intuitive understanding of the interface structure and layout. For example, through the scaling of dynamic effects, displacement or fade out can emphasize or highlight a certain element, so that the importance and status in the hierarchical relationship can be clearly presented. Secondly, through the use of dynamic effects, the designer can intuitively show the state transition of each element, such as the state of the switch button on and off, and the verification results of the form control. This state change can provide instant feedback, allowing users to quickly understand the status of interface elements and operation results.

When adding dynamic effects, designers need to carefully consider them according to the user experience and feedback. If the action cannot provide clear functions or interfere with the user, it may have a negative impact on the user experience. Take the unlock password interface of iOS as an example, when the user enters the wrong password, it can provide immediate feedback by adding a shaking animation effect to help users quickly understand their operation errors, so as to correct.

3.2.2 Physical property

Physical property means that the dynamic effect design should simulate the physical laws of the real world, so that the user can get a sense of sensory reality. Based on Newton's three laws of motion, it summarizes and refines the friction, inertia, gravity, and elasticity prevalent in real life, so as to make the animation on the abstract interface appear more realistic and natural. Before the dynamic design of an element or object, we should first study the motion principle of its matching object in the real world to meet the user's perception and experience of power. For example, if a user drags a dragging element in the interactive interface, the dynamic effect design can simulate the friction force, elasticity, inertia, and other physical effects, so that the user can have a realistic sense of interface resistance to the dragging element. The physical dynamic design can enhance the user's immersion and experience, making the interactive interface more vivid and natural.

3.2.3 Feedback

When interacting, users expect to get immediate feedback to know their operation status and effect. With the use of dynamic effects, designers are able to provide visual, auditory, or tactile feedback to meet user requirements. Feedback action needs to attract users' attention to ensure that users receive feedback information in time. It can be divided into two categories: process feedback and result feedback.

Process feedback is to give feedback and inform the user of the current state of operation. This feedback helps users to have a deeper understanding of the advances and changes in the operation. For example, the influence of the diffusion of sound waves can be used as a process feedback to transmit the received information state. Through the observation of the diffusion of sound waves, the user can understand that the system is processing its voice input. Result feedback refers to the feedback given by the user after the end of the run, which informs the user of the run result or reaction. Unlike process feedback, outcome feedback requires rapid and accurate delivery of outcome information. Lengthy animations can make users feel that the interface is slow, while overly brief animations may hinder their understanding of the changes taking place. Therefore, when designing the animation, designers need to carefully weigh the length and effect of the animation, so as to ensure that users can quickly understand the operation results. In common functions, designers should try to avoid adding complicated or lengthy animations to avoid extending the user's waiting time and affecting the fluency of operation.

3.2.4 Metaphor

The meaning of metaphor is to find similarities between different things, concepts, and linguistic expressions, and to establish imaginative connections. Designers can use metaphors to link the real-world experience, cognition, and behavior with the effects of virtual animation, so that users can quickly understand the operation or content (Liao, 2018). The key to the realization of metaphor is to use the user experience and cognition to simulate the real-world object and to find the real reference to the object of virtual animation effect. This method helps users to quickly understand and adapt to the operation and interaction in a virtual environment, thus simplifying the cognitive burden of users.

3.2.5 Consistency

As another important principle in dynamic effect design, consistency emphasizes applying the dynamic effect of unity, coordination, and reconciliation to the whole or application of the system, so as to achieve the unity of interactive experience. At the beginning of the design, the designer should have a clear definition of the overall dynamic effect, and ensure that this concept runs through the design. This concept should conform to the overall style and design concept of the product, and can clearly guide the design of the dynamic effect. Based on this, designers need to define the occurrence or occurrence mode of dynamic effect combined with functional modules or scene division, so as to avoid the imbalance or contradiction between different modules or scenarios (Huang, 2018).

3.3 The emotional and dynamic effect design of the reflection layer

The reflective layer is the highest level of consciousness, which acts on the user after the instinct layer and the behavior layer. Users choose products not only for beauty and easy use, but also at a higher level for pleasure, satisfaction, and self-identity. Its design principle is to stimulate the emotional resonance of users by reproducing the scene and conforming to the brand characteristics or appeal. When users use goods or experience services, they will understand the formation of personal experience through their social experience, and wake up their previous personal

experience in the form of dynamic reproduction scenes, guide users to connect the animation effect with real life, and arouse the emotional resonance in the memory of the same product.

4. Conclusion

In conclusion, this paper starts the exploration of emotional design from three levels: instinct layer, behavior layer, and reflection layer. The emotional design aims to focus on the emotional needs of users, create an interactive experience with rich emotional resonance through dynamic effects, and establish a deep emotional connection between users and products (Liao, 2018). With the development of technology and the continuous change of user needs, designers need to continuously pay attention to the latest trends and methods of emotional design, to continuously optimize and improve the dynamic design of interactive interface, create more attractive and brand-featured interactive experience, and enhance the attractiveness and competitiveness of products (Chen, 2020).

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