A Study on the Interactive Design and Aesthetics of Website Interface Based on Augmented Reality

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Abstract. With the development of computer technology and the upgrading of human-computer interaction equipment, interactive media technology has been widely applied in daily life, among which augmented reality is the hot focus. In this paper, augmented reality, interactive interface and interactive design are overviewed to summarize the trend of the blending of the three and research and analysis on the aesthetics created is carried out.

Keywords: Augmented Reality, Interface Design, Aesthetics

1. Background
Human beings have always been attempting to abstracting and embodying daily life[1]. In these two totally contradictory processes, the mind has been greatly extended beyond the limit of time and space, which in return enhances the reality through deepening people’s understandings it[2]. With the development of science and technology, the truth of the world has been more revealed, facilitating human beings’ reconstruction of the earth to satisfy their needs due to the nature of labor-saving[3].

As a result, people are committing to expanding their abilities in an effort to make the impossible possible. Consequently, virtual reality (VR), the combination of virtuality and reality, has been developed to create a sense of reality for users who cannot be on the spot for physical limitations through computer technology, realizing the idea of breaking the shackles of time and space.

Further, augmented reality (AR) that is composed of both the virtual scene and the real scene emerges to enrich users’ experience. However, it is complicated, making users face the overload information of the real world and the virtual interface at the same time and a cognitive burden[4]. At the same time, when performing augmented reality interaction, the method used is not consistent with the current one that is user-accustomed, so intuitive and clear prompts are also necessary[5]. Also, augmented reality is also endowed with other characteristics, which make traditional interface design methods cannot be directly reused in augmented reality works[6]. Therefore, a good command of
design principles and techniques specifically for augmented reality interactive interfaces can enable
users to interact smoothly with the augmented reality system, calling for the help of interaction design.
However, the digital market is still full of a large number of products that lack interactive art due to
the neglect of the artistic beauty and the lack of knowledge on the aesthetic mechanism of interaction
design.

2. Introduction of augmented reality-based interfaces

2.1. Definition of augmented reality
Augmented reality refers to the technology that adds influential virtual models on real scenes to enable
human and the models of scene interact to satisfy people’s surreal experience. It is established on the
basis of the virtual reality technologies, including models like scene collection, tracking subscription,
the creation of virtual scenes, the fusion of virtuality and reality, display and human-machine
interaction interface. In a broad sense, augmented reality should be seen as the virtual objects that are
added on reality and the augmentation and extension of reality to deepen users’ understandings of the
environment. The focus is on augmentation, meaning that augmented reality cannot be confined to 3D
space. An addition to the 2D-real-scene is also augmented reality.

Augmented reality has the following three characteristics, 1) the mix of virtuality and reality, 2) real-time interaction, 3) 3D registration.

2.2. Interactive interface
The interaction between human and the machine is called human-machine interaction, and the medium
through which the interaction is carried out is the interaction interface. Human and machine can
communicate and exchange information through this interface, which can complete a two-way
translation of their state and behavior to each other. In a broad sense, the human-machine interface is a
core component of the human-machine system (see Figure 1), which includes three related
components-human, machine, and environment. In this system, the crossing zone between humans and
machines is called a human-machine interface. That is to say, human-machine interface should be seen
as a carrier for information acceptance and exchange between human and machine, in which process
humans receive information through the display and make corresponding judgments and decisions in
the brain, and then manipulate the controller, input commands for the machine before the machine
chooses the corresponding program and displays it. In the circulation system, the human-machine
interface plays a vital role as the medium for transmitting information between human and machine.
The design of the human-machine interface is directly related to the operability of the human-machine
system and the rationality of human-machine interaction.
2.3. Interactive interface based on augmented reality

Simulating the real scene, augmented reality can provide the advanced human-computer interactive interface. Users can not only experience the realism experienced in the physical world through the virtual reality system but also can break through space, time and other objective constraints in combination with the virtual environment, which cannot be experienced in the real world.

Augmented reality technology is promising, especially in the current Internet era. The prospect of augmented reality business lies on mobile phone platforms. The increasing emphasis of various industries on the integration of augmented reality and mobile applications will drive its development substantially. Under this context, the emerging functions of virtual reality, high interaction, and three-dimensional positioning will hugely motivate users to participate in restoring the authenticity of the Internet and connect the Internet with the real world. Shortly, augmented reality and 3D positioning technology will definitely become one of the development trends of human-computer interaction technology. The realization of augmented reality technology mainly relies on AR smart glasses and equipment to achieve a three-dimensional display of images. The companies currently targeting AR glasses business include Apple, Huawei, Facebook, Samsung and others. According to the “Global Output Value Guide on Augmented Reality and Virtual Reality” issued by IDC in 2017, the total output value of equipment and services in the AR / VR industry reached $11.4 billion in 2017, $215 billion in 2021. According to IDC and Shanghai Securities Research Institute, it is estimated that by the year 2021, the compound annual growth rate will reach 108% (see Figure 2).

![Output value of VR/AR equipment and services over the years](image-url)
3. Interactive design and aesthetics of website interface based on augmented reality

3.1. Interactive design of website interface based on augmented reality
In comparison to the traditional website interface, the interactive design based on augmented reality establish the interface after analyzing users’ needs and tasks, endeavoring to provide a sense of immersion and interaction. After the incremental interactive design, the application of augmented reality will result in a website interface characterized by visualized figures, which reduce information load and the learning cost of cognitive activities. This website interface will be more user-friendly, and the interaction between human and machine will be improved with the virtuality and reality complementing each other.

3.2. Aesthetics of website interface based on augmented reality
The aesthetic essence of interactive design is that through the interaction between users and products, customers can not only use the products happily and conveniently but also have a joyful emotional experience, in which process the aim of emphasizing users’ experience and practicality can be upgraded to highlight aesthetics. In fact, in the current social life where popular culture is the mainstream, artistic appreciation is dominated by individual emotional components. As a result, the art appreciation activities of interaction design can be carried out only when users’ feelings are paid attention to.

Augmented reality creates a new kind of space art, which combines the beauty of art and technology, form and content. Aesthetics developed has the traits of identification, diversity, inclusiveness, and flexibility. Accordingly, users will obtain an augmented aesthetic experience since this technology gives them both the sense of alienation and familiarity. Therefore, the interactive interface based on augmented reality is more individualized and open.

4. Summary and outlook
As a front-end technology leading the era of three-dimensional interaction, augmented reality technology makes the interactive interface one of the primary development modes of the user interface of the next generation. Based on the current advanced augmented reality technology, this article analyzes it from the perspective of aesthetics. The aesthetic essence of interaction design is to make people’s essence, strength and ideals satisfied and liberated through the interaction between users and products. With the continuous development of science and technology, more computer technologies will be integrated into the design of human-machine interfaces in the future, which will continuously meet consumer needs and improve user experience. Especially in the context of the growing spiritual needs of people, the development of new technologies in line with people’s aesthetic needs can undoubtedly create more outstanding virtual interactive products, such as the rapid development of human-machine interaction technology based on artificial intelligence algorithms.

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