# Innovative Development of Graphic Design under 3D-Style Visuals: Postprint

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## Abstract

With the development of the times and advancement of technology, 3D technology has also experienced rapid development, bringing forth brand-new visual design elements. Under this influence, traditional graphic art design can no longer meet the normal needs of the market; its development has been subjected to tremendous impact, while simultaneously facing new development opportunities. 3D-style visual elements possess numerous novel aesthetic characteristics, enabling the visual language of graphic design to become richer, its forms of expression more diversified, and its sensory effects more three-dimensional. [1] Through the application of 3D-style visual elements, created works exhibit prominent individuality, strong spatiality, distinct artistic conception, and harmonious, orderly color hierarchies. These characteristics endow graphic art works with richer connotative interest, align the aesthetics of graphic art works with people' s needs, create visual resonance, engender an ethereal aesthetic experience, and also enhance people' s artistic cultivation. Therefore, innovation in 3D-style visual graphic art design has gradually become the mainstream of graphic art design, leading the development of the future graphic art design industry.

## Full Text

## Preamble

**Title:** Innovative Development of Graphic Art Design Under 3D Style Visuals

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**Abstract:** With the development of the times and technological progress, 3D technology has experienced rapid advancement, introducing entirely new visual design elements. Under this influence, traditional graphic art design can no longer meet the normal needs of the market; its development has encountered

tremendous impact while simultaneously facing new opportunities for growth. 3D style visual elements possess many new aesthetic characteristics that can enrich the visual language of graphic design, diversify its forms of expression, and enhance its sensory effectiveness with greater three-dimensionality. Through the application of 3D style visual elements, created works feature prominent individuality, strong spatial sense, distinct artistic conception, and harmonious, orderly color hierarchies. These characteristics endow graphic art works with richer connotations, align their aesthetics with people' s needs, create visual resonance, provide an ethereal sense of beauty, and enhance people' s artistic foundation. Consequently, the innovation of graphic art design under 3D style visuals has gradually become the mainstream of graphic art design, leading the future development of the industry.

**Keywords:** 3D visuals; graphic art; web design; poster design; logo design

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## Introduction

We are currently in the information age, where network technology has profoundly transformed our production and lifestyles. Particularly, the increasingly widespread application of "Internet Plus," combined with multimedia information technology, has changed people' s consumption patterns. Driven by commercial competition, various forms of advertising are growing exponentially. Against this backdrop, the expressive methods and implementation approaches of graphic art design are undergoing profound changes. Since its inception, 3D technology has rapidly captured public attention. The novel visual elements born from 3D technology deliver realistic stereoscopic effects and more intense visual experiences, gradually winning popular favor and finding extensive applications across industries. For instance, it has propelled the development of 3D digital terminal products such as 3D televisions and 3D gaming consoles, which have entered ordinary working-class households and profoundly influenced people' s entertainment modes.

The widespread application of 3D style visuals will inevitably bring tremendous innovation to traditional graphic art design, creating new development opportunities and artistic vitality. Integration with 3D style visuals represents one of the future directions for graphic art design. Therefore, against the backdrop of 3D technology revolutionizing numerous industries, how to successfully combine 3D visual elements with graphic art design to create more unique and distinc-

tive works through more artistically vibrant and visually impactful techniques has become an important task we must address. This paper elaborates on the relevant characteristics and artistic expressiveness of 3D visual elements, and further explores new design approaches that integrate and mutually promote graphic art design and 3D visual style according to the unique expressive forms of graphic art design, thereby broadening the development prospects for graphic art design.

## 1. Concept of 3D Visual Elements and Graphic Art Visual Design

3D, as the name suggests, refers specifically to three dimensions in Chinese, denoting spatial forms with length, width, and height. Compared with two-dimensional planes that possess only length and width characteristics, most objects people visually perceive in daily life exist in three dimensions. These objects feature unique expressive effects in color hierarchy, texture, spatial three-dimensionality, and external objective form, with their images primarily generating spatial perception based on human visual disparity. In recent years, with the continuous development of information technology, computer hardware and software technologies have been constantly innovating, with their cost-effectiveness continuously improving. Computer assistance has brought new development requirements to the art design profession. Based on computer technology, we can develop and design 3D art application software with strong professional performance, fully demonstrating numerous professional capabilities in art design and producing powerful artistic design effects.

From the perspective of individual human experience, the retina' s function primarily perceives two-dimensional space, while three-dimensional spatial perception requires not only the retina but also the assistance of binocular disparity. In an adult, the distance between the two eyes is approximately 70mm. When viewing object shapes on a plane with both eyes, the visual images are identical and combine on the retina simultaneously. However, when perceiving objects with three-dimensional quality, the retinal images cannot align, and the objects seen within the visual field are processed by the brain to form visual information, enabling people to establish a rich sense of three-dimensionality and recognize distance, depth, and space. Throughout human development, especially in past eras with low scientific and technological levels, humans could not use three-dimensional models to describe the objectively existing three-dimensional world. Nevertheless, possessing strong expressive desires, they could only rely on two-dimensional planes such as paper and parchment to record the objectively existing three-dimensional world and understand it through imagery. With continuous civilization development, the emergence of printing and papermaking technologies gradually strengthened human cognition of two-dimensional space, forming a concrete yet abstract 2D civilization system.

Over the past century, with the rapid development of the third industrial revolution, the emergence of the internet and computers has greatly transformed

the course of human civilization. Today' s 3D technology particularly refers to digital 3D technology based on the internet and computers. Through this technology, people have gained new understandings of the three-dimensional world, achieving and surpassing the initial realm of stereoscopic intuition. This represents a profound digital revolution that has exerted significant influence on all aspects of human production and life.

Graphic art design is a form of modern art design that primarily involves delineating different types of graphics in two-dimensional space according to their outlines and recomposing images according to certain rules. Graphic art design finds widespread application in numerous fields. In today' s information age, corporate logo design, advertising design, and the design of many hardcover books all require graphic art design. Simultaneously, the information revolution has also expanded markets for advertising promotional videos and product catalogs, integrating graphic design with people' s production and life. The spatial sense presented in graphic art design appears relatively three-dimensional, but it is not true three-dimensional space. Rather, it is a technical method expressed by graphic art designers using unique techniques that create a certain visual impact, generating an illusory three-dimensional spatial experience in people' s eyes.

According to the imaging principles of the visual system, the visual sense exhibited by graphics is a gradual transmission process and a slowly perceived experience—that is, initially attracting visual attention, then creating psychological and physiological comfort, and finally stimulating the soul' s aesthetic experience from a visual effect perspective. Therefore, the sense of picture presented by graphic design is highly vivid and lively. It requires the delicate artistic arrangement and combination of graphics, text, and various colors to construct an atmosphere that can stimulate people' s aesthetic pleasure, providing us with unique aesthetic experiences, enriching people' s aesthetic interests, allowing people to perceive beautiful details in ordinary life, elevating their aesthetic levels, and thereby achieving certain goals of perceptual identification.

## 2. Technical Methods and Means for Creating 3D Visual Elements

The 3D visual effects created through 3D virtual technology, when perfectly integrated with graphic design art, can present more artistically three-dimensional, orderly, and conception-creative characteristics in graphic and color variation structures by combining this effect with other visual effects perfectly. When presenting this effect, there are two main approaches. First, using traditional methods of expression, common techniques include color variation, light-dark relationships, shadow methods, and so on, to create the most artistically three-dimensional visual effects, similar to traditional Chinese ink painting, presenting an effect of "color as ink," with simple realism in the foreground and three-dimensional abstraction in the background, subtle color variations, and unique conception painting techniques and forms. Second, using modern technology-

intensive 3D art software for creation, leveraging the software' s rich artistic characteristics and unique design advantages to create virtual three-dimensional scenes with prominent three-dimensional effects, allowing them to move and change according to rules, and enabling the rational combination of virtual lighting and cameras. In artificial photography studios, visual scenarios that traditional photography studios cannot express can be virtually presented through computers. Using 3D images and visuals, rich presentations can be achieved through computer systems, and producers can modify and edit at any time, fully demonstrating their creative talents and imagination.

The overall creation process of 3D visual elements proceeds as follows: First, combine 3D images with software and use the software for three-dimensional modeling. Second, set animation effects based on completed modeling. Third, establish cartoon materials and parameters and combine materials with the aforementioned three-dimensional models. Fourth, set and present the dynamic effects of keyframes. Fifth, construct camera lens images and language to allow their movement trajectories to present reasonably. The most important purpose of this process is to facilitate the dynamic presentation of 3D visual elements and rendered images and transmit them using virtual camera effects. Sixth, construct a large environment view and process it into a texture map to vividly express rendering effects. The final step is to construct renderer parameters to render 3D visual elements and create dynamic rendering files. Finally, within the expected innovative target design requirements, continuously improve and modify relevant work to achieve the final design plan.

## 3. Application Prospects of 3D Style Visuals in Graphic Design

The fusion of graphic art design and 3D visual elements can create unique works. Designers use 3D virtual means to break past concepts, expressive forms, and morphological constraints of graphic art design, representing progress and innovation in both sensory interaction and visual presentation. In recent years, many classic cases designed through continuous innovation and development have made graphic design more hierarchical and vivid, bringing people new aesthetic pleasure and visual effects. Meanwhile, 3D visual elements have also been widely applied in product identification and commercial advertising. Many smartphone brands and automobile manufacturers have employed this visual art style, which has not only improved corporate reputation and market share but also gained recognition and favor from many customers, effectively enhancing corporate competitiveness.

Currently, the external expression of 3D style visual elements has gradually penetrated and influenced graphic art works, inevitably exerting significant influence on future design development. In exploring the application of 3D style visual elements to graphic art design, this paper proposes the concept of 3D visual elements. Most excellent 3D techniques in meaning are created by designers relying on their intelligence and open imagination, innovatively designing 3D visual el-

ements with distinctive artistic styles and combining them with graphic art as a unique and effective method. 3D style visual elements also have promising prospects in web production and design fields, such as transparent buttons with 3D characteristics and web navigation bars. In today' s information age, people' s life rhythms continue accelerating, with everything pursuing maximum productivity and efficiency, making it easy to fall into the cycle of aesthetic fatigue. The emergence of 3D style visual elements has endowed graphic design elements with new connotation characteristics, such as rich visual language, vivid shape creation, unique expressive effects, and sensory methods, featuring prominent individuality and strong three-dimensional effects in specific three-dimensional presentations. These characteristics better align with modern people' s aesthetic features and methods, more easily stimulating resonance and allowing people to obtain full aesthetic enjoyment.

The 3D visual style has broad application prospects. This style can not only fully display the thematic effects of graphic art design but also serve these thematic effects with its unique aesthetic sense and structural charm, allowing them to develop fully. Against today' s background of pursuing aesthetic individuality, the ideological forms and expressive content contained in 3D visual elements will surely carry forward the ideological concepts of aestheticism in artistic creation, widely apply them to graphic art creation, promote the development and innovation of graphic art, bring people a new aesthetic system, elevate people' s spiritual aesthetic levels, and let aesthetic concepts penetrate deeply into people' s hearts.

## 4. Application Techniques of 3D Visual Elements in Graphic Design

### 4.1 Specific Application of Visual Elements in Web Design

In the internet era, with rapid information development, the internet profoundly influences people' s lives and entertainment modes, also driving innovation in many websites. People have increasingly higher requirements for web pages and now enjoy integrating 3D elements into web design—an idea that was impossible to realize in the past due to weak computer information processing capabilities that could not provide a good platform for this technology. Now, with rapid development in computer processing levels and greatly improved storage capacity compared to the past, integrating 3D elements with web design has become a common design method. The promotion and implementation of this concept not only enhances the aesthetic appeal of the designed products but also brings rich aesthetic feelings to people, elevating their aesthetic capabilities and visual sensations. For example, when designing a website for a certain brand, designers can use three-dimensional expressive sensations to give the webpage strong color visual effects and stereoscopic effects, following dark and bright color variations to enlighten people' s minds while bringing them strong visual insights and spiritual shock.

### 4.2 Application of Visual Elements in Poster Design

Posters can quickly transmit massive amounts of information and possess enormous artistic influence and expressive power, finding widespread application in many fields. Poster design also contains much content from graphic design. Therefore, to make posters stand out with three-dimensional sensation, designers should emphasize their color variations, primarily designing information that people can perceive through visual effects, allowing them to obtain profound visual sensibility. In the poster design process, the design should not be overly complicated—it must convey key information while maintaining distinctive features. Integrating 3D visual effects into posters can not only shock people' s psychology but also allow them to experience rich visual effects. Currently, the most commonly used methods are shadow shaping of fonts and highlight techniques to present these effects, elevating the artistic taste of posters and enriching people' s visual effects.

### 4.3 Application of Visual Elements in Logo Design

Logos are a crucial symbolic means of expression that can convey important information about an enterprise, such as its content products, development characteristics, humanities, and technology. Additionally, a corporate logo can leave an important impression in consumers' minds, allowing them to gain preliminary understanding of the enterprise. Logos feature artistic and functional diversity characteristics. By studying corporate logos, much important information can be obtained. For example, by studying the evolution of a national logo, one can analyze the economic development of a region or country at that time and understand people' s aesthetic characteristics and artistic development patterns. By exploring the different logo characteristics of a country or region, one can comprehensively understand that era and understand the patterns of artistic characteristic changes through the logo' s evolution. In today' s highly developed information age, logo styles are gradually transitioning toward modernization and informatization, and 3D visual factors have been perfectly applied in logo design, providing people with rich visual experiences. For instance, in 360 Company, the logo of 360 Security Guard fully applies this important characteristic of 3D visual elements, visually and three-dimensionally designing a sphere with strong visual impact. The color and shadow design is also just right, fully expressing the characteristic of 360-degree three-dimensionality without edges or corners. This type of graphic design primarily uses the mutual contrast and foil between light and shadow to present strong visual effects, thereby achieving success.

## Conclusion

In summary, this paper elaborates on the innovative development of 3D style visuals in graphic design from five major aspects: the concept of 3D visual elements and graphic art visual design, technical methods and means for creating 3D visual elements, application prospects of 3D style visuals in graphic design,

and application techniques of 3D visual elements in graphic design. It concludes that visual elements represent the main future development direction of graphic design. They employ modern design concepts, elevate people' s aesthetic levels, profoundly influence the development of graphic design, add artistic charm to it, and provide more possibilities for graphic art design.

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*Note: Figure translations are in progress. See original paper for figures.*