



# Research on Multidimensionality Design of Computer Art Fonts

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**Abstract.** When computer graphics software is used as a design tool for fonts, it becomes very convenient for fonts to be enlarged, reduced, elongated, flattened, and slanted, and the artistic production effects such as metal characters, wood-grain characters, crystal characters, flame characters, and embossed characters of the artistic modelling of Chinese characters can be realised. Due to the reproducible and revocable function of computer software, designers can freely play with their imagination to design artistic fonts.

**Keywords:** computer, artistic fonts, multidimensional design, graphics software

## 1. Graphics software and Chinese character design and production

In the 1990s, some professional graphic software was born and borrowed by some organisations and designers, and their common feature is that they can do text or image processing without programming[1]. 1996 Thomas and John Knoll of the United States launched Photoshop 4.0 software, which integrates the functions of image scanning, editing and modification, image production, advertisement creativity, image input and output, It is popular among graphic designers and computer art lovers. The software is very popular with the majority of graphic designers and computer art enthusiasts.

After CorelDraw, Painter, 3D Studio Max and other software continue to emerge, the version is constantly updated, more and more powerful, computer art creation has been applied. Graphics software is used in computer technology to generate, operate the software. Graphics software provides a library of programmes that can be invoked in a programming language, and its basic mode of operation is to generate, manipulate and store graphics or present them visually on a variety of graphics devices. Professional image processing software Adobe's Photoshop series (dot matrix bitmap), professional publishing and arranging software CorelDraw, Illustrator, Freehand (vector graphics), application-based processing management, processing software Picasa and so on.

CorelDraw software, its drawing tools include circular, rectangular, polygonal, square, spiral line, and with the shaping tools and special brush pen, writing pen, sprayer[2]. CorelDRAW software based on descriptive colour advantages, to achieve

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M. R. Mohyuddin and N. A. D. IDE (eds.), *Proceeding of the 2024 International Conference on Diversified Education and Social Development (DESD 2024)*, Advances in Social Science, Education and Humanities Research 899,

[https://doi.org/10.2991/978-2-38476-346-7\\_20](https://doi.org/10.2991/978-2-38476-346-7_20)

the storage file is small, colour description into a specific information figures, provides a variety of modes of colour mixing scheme and the application of spot-colour, gradient, graphic pattern, material, grid filling. A wide range of complex colour overlay effects can be performed, and its colour management scheme allows display, printing and printing to achieve basic colour consistency. As vector graphics and resolution-independent, vector graphics scaling size in the output device to print will not miss the details or reduce the clarity of the text of the most ideal printing process, support for the vast majority of image formats input and output, become a professional software for graphic design and publishing and printing.

Photoshop software is based on the description of the form of bitmap images, is the use of pixels as the image composition, colour change level is very rich. Its functions are image editing, image synthesis, calibration colour and special effects production, image editing with zoom in, zoom out, rotate, tilt, mirror image, perspective, copy, remove speckles, repair, modify the image of the residual damage and other functions. Coupled with the processing of special filters, the rendering of the three-dimensional effect on the image effect adds a rich performance space. Can simulate the real effect of the photo, applied to font design, you can make flash words, flame words, three-dimensional metal words, crystal words and other special effects font.

The use of Photoshop software to create neon characters, As shown in Fig.1, The use of Photoshop software to create special effects fonts rely mainly on the powerful features of the filter, its different special effects font system production methods will be different, and there is a plane software and three-dimensional software to work with each other to produce[3].

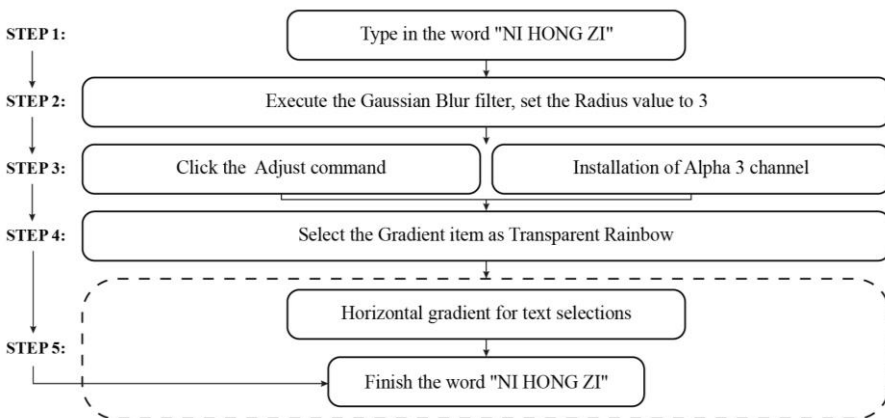


Figure 1. Neon font design step-by-step diagram

Like 3D Studio Max is a three-dimensional image production software, it is an integrated three-dimensional production software, with modelling, mapping, lighting, rendering, animation functions, since the date of birth has been widely used in three-dimensional animation, and then become a 3D art font design and production means.

## 2. 3D Art Font Design

The use of graphics software design of art fonts, in practice, has formed a lot of excellent works, they are generally a variety of software mixed production to achieve. In general, the production method includes software menu text tools, brightness adjustment, contrast adjustment, colour adjustment, filter adjustment, mask mask selection, cloning, imitation stamp, smear and other technical means. As shown in Fig.2, use adobe illustration and photoshop software to design and produce 3D art fonts. The first step; open AI, create a new canvas, enter "visual communication", set the text colour to blue, Effect > 3D > Extrude & Bevel, adjust the angle of the font, lighting and other elements of the position, complete the 3D settings of this group of fonts. Step 2; do a good job of the font "visual communication" paste (ctl + v) to ps inside, copy select "smart object" in order to facilitate changes in its size. Adjust the word open PS, create a new canvas 600x800 pixels, the background colour is set to white. Copy (ctl+c) just in AI inside the body in the canvas layer order and position layout. Step 3; tick three-dimensional characters, use the gradient tool to make a gradient effect to distinguish between light and dark. The production of the first cloud brush added to the text inside, and then use the deepen and lighten tool to enhance the dark and light details. Hold down the Ctrl key and click on the layer to bring up the ant line, create a new layer and use the white brush to erase the parts that need to be brightened. Image > Adjustment > Shadows/Highlights, and finally sharpen it appropriately. Step 4; open the background material, create a colour balance adjustment layer, adjust the middle tone, with a mask to wipe around and background integration. Step 5; hold down the Ctrl key and click on any text layer, a new layer and fill any colour, and then change its fill to: 0%, modify its layer style. Add highlights in the current layer above the material, mixing mode for the "dropout", to complete the establishment of the highlights group, and finally get to the idea of the 3D font effect.

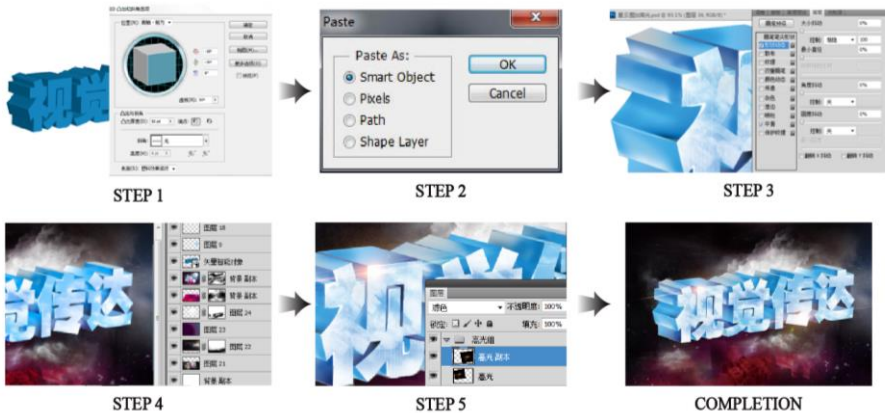


Figure 2. 3D font design production steps

With the application of 3D Studio Max software in art design, 3D dynamic fonts applied to the title gradually produced, during which the main use of font library fonts to produce stereoscopic and animation effects. Such as the use of Xara3d software to produce 3D dynamic fonts. Step 1: Open Xara3d software. Step 2: Click on the "Font"

option, select the font you need, and press the "Delete" button to directly delete the text on the software. Step 3: Input the required text directly. Step 4: Use the 7 options on the right side of the software interface to make the text into the desired effect. Step 5: Click on "Animation Options" and select the type of animation in "Animation Extractor". Step 6: Click "File" - "Export Animation". Step 7: Click "Save".

The emergence of 3D art fonts has created a new conceptual space for Chinese character design. Chinese character fonts have moved from two-dimensional to three-dimensional space, and the richness of colours and shapes of fonts cannot be achieved by traditional paper media. The most prominent aspect of using computers for Chinese character design is the cross-existence of two-dimensional space and three-dimensional space in Chinese character design. That is to say, it creates a three-dimensional spatial effect on a two-dimensional plane; or it deals with the two-dimensional visual effects of three-dimensional Chinese character images in three-dimensional space; or it transforms from a single medium to a fusion of multiple forms of artistic expression, which moves Chinese character design towards the space of multidimensionality art form.

### **3. Multi-dimensionality Design of Computerised Chinese Characters**

#### **Application of Gloss and Material in Font Design**

The bright colours, transparent colours and simulated colours of computer graphic design, as well as the texture, blurring and feathering effects achieved by filters, etc., are applied in the design of Chinese characters, adding new ideas to the creative space of Chinese character art font design[4]. For example, the use of contrasting colours in the background of the screen, the contrast of gloss and brightness, the crystal-clear brightness, the spatial effect brought about by light projection, the organisational and choreographic effects of multiple transparent colours, multiple shadows, multiple reflections, and the two-dimensional and three-dimensional crossover design forms of expression provide support for the multi-dimensional expression of the Chinese character art fonts.

The use of light, shadow and material effects is a wonderful means to show the relationship between three-dimensional space and two-dimensional planes. Materials with a sense of texture exist as three-dimensional entities in their own right, and the unique texture that texture possesses is an effective tool to assist in the expression of the meaning of words. As a basic form of visual language, texture, like colour and line, has the function of modelling and expressing emotions. For example, the computer-produced Chinese character design works, with Song strokes in black and the background glossy effect to form a strong sense of spatial dimension, the screen around the text of some material mapping and texture, the use of transparency, shadows, reflective effects. Due to the use of glossy perspective effect, the combination of material mapping in the text strokes refracts the sense of volume, and clever use of gloss to create a sense of space in the distance and near the scene, the font's light-facing side and the backlit side of the natural shadows cast to show the difference between light and dark. The contrast of colours in the picture is strong, and the white background and black strokes form a spatial effect through light and shadow, which is simple and clear. For

example, Kong Sen's "Graphic Design in China" integrates the regular script into the whole picture, with the positive and negative overlapping of the text forms, which are hidden in the black and white reality, and combined with the effects of Chinese painting and ink rendering to create light and texture effects to form space. This kind of material with texture itself exists as a three-dimensional entity, and as the picture has the effect of light, it naturally produces the difference between light and dark, thus creating a sense of volume in space.

Chinese character font design in the gloss and material multi-dimensional expression of the art of two different forms of expression, the use of computer-generated light, texture, material, there are many unexpected natural marvellous, or a unique visual illusion effect, they are unknown two-dimensional plane and three-dimensional space conversion art[5]. This phenomenon of light and shadow does not exist in the objective real world, and it is one of the important means for computerised Chinese character design to present a multi-dimensional performance, and it is also a visual game for designers to use computers to develop the idea of font design and explore it continuously.

### **Combination of Chinese Characters and Graphics Produces A Sense of Dimensionality**

The combination of Chinese characters and graphics is a kind of visualisation of the meaning of words to form a word map, and the meaning of the word map can play an infectious visual role. For example, the use of digital images and photography to embed natural or processed image forms into fonts for decoration, and then processing the images through filters to achieve the purpose of reflecting the theme content. As shown in Fig.3, The use of computers to graft and convert the strokes of Chinese characters and graphics, overlap the text strokes and graphics and highlight the font, or blur the edges of the text and graphics, texture, embossment, wave processing, resulting in disorderly and chaotic novelty images, misprints of the superimposed text effect and so on. The combination of Chinese characters and graphics can make the font form the difference between the real and the imaginary, and the graphic of Chinese character strokes is a kind of mutual supplementation of the real and the imaginary, which constructs the effect of the Chinese character shapes that are compatible with each other and hidden from view. The combination of Chinese characters and graphics produces a sense of dimension that brings Chinese characters into the realm of hieroglyphics and assumptions, where words are graphics, graphics are words, text strokes become graphics, graphics become text strokes, and so on, and the emergence of these new spatially imaginative artistic fonts with a sense of dimension brings the design of Chinese character artistic fonts to a new aesthetic height.



Figure 3.3D Chinese character and graphic poster: spring, summer, autumn and winter (author's own creation)

### The Sense of Dimension of Grid Character Design

The grid has been used since the 19th century as a design method in the Western Structuralist, Dutch Stylist, and Swiss Internationalist styles, and this method still plays an important role in text design for digital media[6]. Text design in grid design coincides with the idea of ‘procedural’ design. Grid can be used to increase the spacing between lines of text to strengthen the role of each line of text in the design of the layout, creating visual expansion, but also exaggerated word spacing, ultra-wide spacing in the design of the text to play a ‘point’ effect, but also boldly make the paragraphs consciously staggered, set up special text blocks, so that the text at the same time have the effect of the image. effect.

Grid as a concept, its law is the mathematical geometry of the laws of a variety of variants of processing, is a kind of auxiliary lines, boundaries and columns composed of a hidden system. Grid composition design emphasises the sense of proportion, order, wholeness, and modernity, creating a simple, unadorned style of layout art[7]. Grid types include single-column grid, two-column symmetrical grid, three-column symmetrical grid, multi-column grid, asymmetrical grid, gradient grid, etc. The grid itself can bring a sense of order and structure to the design screen. For example, in the layout according to the theme to determine the size of the layout, establish the width of the screen, the size of the blank, horizontal and vertical columns, the number and size of the Chinese characters into the Chinese characters can be arranged around the grid can be determined, but also in the same to seek changes, that is, based on the basis of the grid for different degrees of change, or contradictory perspective, or gradient, positive and negative and other effects.

Grid and text layout design mainly refers to the books and newspaper layout, in the layout in accordance with the pre-determined skeleton for the text of the arrangement of the position, of course, also need to take into account the composition of the grid law. Because different grids are fixed position, only by relying on the position of the text changes, or through the size of the font size changes, to be able to create a sense of hierarchical dimensions of the primary and secondary. As shown in Fig.4, the poster consists of a large span of gradient grid as a skeleton, resulting in a small near large perspective effect, the picture of Chinese characters and English in accordance with the

grid skeleton requirements, through the text strokes (radicals), the size of the cross-arrangement of the grid, the grid gradient caused by the gradient of the text size, the overall dynamic characteristics and the sense of illusory space, to form a strong visual impact.



Figure 4.Gradient Grid Poster

This case is a pure grid as the skeleton for Chinese character design works, however, grid composition Chinese character design works are expressed in graphic style.

## Conclusion

Computer technology has created a new way of design, the field involved in font design is no longer limited to the printing design medium, and the multi-dimensionality of Chinese character font design is a characteristic of the era of computer design. The concept of Chinese character art font design has gradually evolved into a variety of visually related design media, transforming from a single medium to the integrated design of multiple media. The different forms of computerised Chinese character art font design have led to profound visual changes in graphic font design. The combination of tradition and modernity, photography, painting, film and television technology, network technology, images and digital technology have changed the rules of the game of Chinese character font design, and the art of Chinese character design has moved from two-dimensional and three-dimensional forms of expression to the era of three-dimensional dynamic font design.

## Acknowledgment

This thesis is one of the results of the general project ‘Research on Cultural and Creative Product Design of Jingchu Han Embroidery in the Context of Cultural and Tourism Integration’ of the Open Fund Project of Hubei Cultural and Creative Industrialisation Design Research Centre in 2022, Project No.: HBCY2207.

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