Print Art Design Method based on Multiple CAD Algorithm

Lixian Wang[1] and Zhao Zhong[2*]

[1]College of Art and Design, Shaanxi Fashion Engineering University, Xi'an 712046, China,
wanglixian1213@foxmail.com
[2]Public Art Department, Xi'an Academy of Fine Arts, Xi'an 710065, China,
50102@xafa.edu.cn

Corresponding author: Zhao Zhong, 50102@xafa.edu.cn

Abstract. Since 1990's, cad has been widely used in the field of environmental art design. With the progress of computer hardware and software, CAD has gradually become the mainstream of architectural renderings. In the eyes of designers, printmaking is the same as other art forms, which can inspire them to design clothes or use the concept of printing, techniques, media materials and color matching principles of printmaking. Designers can open the wings of imagination in an unimaginative way and bring surprise and touching to people again and again. So, the line of print, or casual and bold, strong and eye-catching, then the use of this rhythm rhythm in clothing design should present a very striking and strong decorative style. This paper will use multivariate computer aided technology to enrich the application of Chinese printmaking in different industries through the unique design language and expression mode provided in printmaking design, and provide some reference for the subsequent packaging design and solutions for computer aided design in environmental print design problems.

1 INTRODUCTION

Human society after hand industry and big industrialized era, entered the computer as the platform of electronic information era of the era of the three fundamental change is the result of the social productivity and the improvement of science and technology development, which makes people's life style and way of thinking changed grips the handicraft industry era human's role is to high. Nothing can be done without man power. In the age of industrialization, mechanical movement took the place of manual labor. With the liberation of people's physical strength from the traditional handicraft industry, people's taste is getting higher and higher, and the pursuit of beauty, the speed of enjoying beauty is getting faster and faster. This huge change in people's

way of thinking has a direct impact on all aspects of daily life. People have been unable to meet the requirements of large quantities of industrialization in the field of architecture and other fields. For this reason, they began to call for the arrival of a new era until the second World War. In the period of the second Industrial Revolution, the advent and popularization of computers and automatic devices greatly promoted the development of social productivity and freed the art and design of printmaking in a sense. With the development and application of computers, people's lives change with each passing day [1].

The application of computer graphics design will gradually affect people's cognition of design, and form a new aesthetic consciousness of design and a new way of thinking of design. Such as computer aided building roaming animation of computer in environmental art design, can be more real simulate real scenes, viewers can watch the space effect of different point of view, give a person a kind of immersive feeling. The space effect with reality so close to the virtual space of expression is other performance means difficult to achieve. Through the application of computer three-dimensional software technology, a virtual world that does not exist is created, so that the designer's creative imagination can be truly realized. In the work, lighting, sound and other effects can also set off the atmosphere of the scene, and improve the vividness and authenticity of the work. The application of computer printmaking design technology makes the space of environmental art broader and means more abundant. The expression technique of the real virtual space and the aesthetic feeling it brings will exert a subtle influence on people's aesthetic orientation.

In the context of the rapid development of computer science and technology, computer aided environmental art design is to create a new form of printmaking art by means of the integration of science and technology with art. This new form can be said to be the artistic technical form, also can be said to be the technical art form, precisely is a form of science and technology and art connotation perfect integration. Since the 1970s in China, the computer has gradually become the main tool of design performance, which has led to a design revolution and created a new form of visual art with the emergence and continuous update of various drawing software, designers can express their own design creativity through the computer. Through a variety of three-dimensional drawing software update, so that the indoor and outdoor architectural effect performance more and more vivid [2].

2   RELATED STUDIES

Abroad at present and the subject more related topic, there are some topics about pure print art will also have some print art combined with other forms of art, but not to print the combination of art and clothing research there are 2 essay topic related domestic literature. Zheng [3] study the use of print element in modern clothing design. The other one is about the relationship between costume patterns and Chinese printmaking, so this topic is relatively innovative. The author will introduce the application and research of printmaking art in costume design comprehensively, and show some practical results. In the process of historical development, Mahmood et al. [4] draw lessons from the other Chinese print art culture and art heritage concept, combined with a variety of expression, to break the bondage of the self-styled ideas, learn from each other and provides a basis for the open development of engraving art. The form of many designers have been trying to extend engravings, tried to use print concept to explain The essence of the plane design creation.

Prints as excellent Chinese traditional art culture in the handmade soap use print art technique in the design of packaging design not only can foil the culture grade of the goods, but also can carry forward the traditional Chinese art and culture Woodcut printmaking uses circular knife Triangle knife etc. on the board or hemp offset produced during the carving knife method has fascinated people. Muss et al. [5] thought the rhythm of the black and white concave and convex texture and smooth line beauty can make packaging show strong artistic effects (as shown in Figure 1). Therefore, the diversification of packaging design styles and products can be expressed through clever composition to express the picture in a full or simplified style. With the rapid

development of computer hardware and software technology, the computer aided art design has received the widespread attention in the field of environmental art design and application of computer aided technology inseparable from the creator and appreciator two aspects by Paoli et al. [6], and both want through certain sensory and perceptual material corresponding media, the former to create the aesthetic objects, the latter achieve aesthetic pleasure. Therefore, as print art design, computer-aided design works should not only depict the scene truly, but also make the audience to achieve aesthetic pleasure.

Figure 1: Taiwan Tea seed hall brand and packaging creative design.

Engraving is a picture with a long history, and evolved from the traditional Chinese printing, it has a unique artistic form and exquisite craft technique. Price et al. [7], printmaking also belongs to the category of art, can bring them to the design of clothing inspiration, can become a designer's creation source can learn the technique of print, You can learn the media materials of printmaking, and also learn the black and white color matching of printmaking [8]. Designers can open their imagination in an unrestrained way and bring people surprises and artistic design works. The traditional process of printmaking art can realize woolen printing and many fabrics that cannot be digitally printed can realize the processing of printing and the mechanism effect and art form is very rich and colorful. This paper can be divided into two parts to explore. The first part is the basic theory part, and the second part is the design practice part. Make the process a large number of data research, such as hand method and then apply these print art forms in different design fields, such as in the clothing modelling, the application in the clothing color, the application in the clothing pattern design and the application in the application of fabric and then through the theory study, design research to practice [9,10].

3 RESEARCH ON THE PRINT ART DESIGN METHOD BASED ON MULTIPLE CAD ALGORITHM

3.1 The Artistic Characteristics of Engraving

1. Retain the natural and rustic feeling of the creation object as much as possible, showing the smell of wood (woodcut) 2. The unique artistic effect of printmaking can be obtained by using the artistic technique of leaving black artfully and giving special treatment to the depicted object. 3. Give full play to the watermarking characteristics of the engraving plate, so that the part of the large area of Yang engraving has a strong artistic effect. 4. Cleverly through the composition of

the composition, with simple light and sparse and dense plump and other different styles to express the subjective feelings of the creator. To sum up, ancient Chinese printmaking has its own unique development track in the long history and has formed a very distinctive artistic expression as shown in Figure 2. Mr. Zheng Zhenduo once said: Lizao picture, in order to promote the culture, the merit is beyond words, which is a proper description of the status of printmaking art. Printmaking has the visibility of aesthetic planar modeling and the function of pure art. In the process of making, will often pursue the subjective artistic emotion and objective natural landscape to achieve a high degree of unity, so as to create a profound artistic conception of beauty how to create this atmosphere? Peng Jixiang said in Chinese art that there are two main points: first, an excellent art work should blend the scene with the object and the self, and an excellent art work should combine the virtual and the real, with endless aftertaste. This will require the printmaker to have artistic connotation and knowledge and techniques, and put himself Images of the content and emotional expression do highly unified, the scene When creating print art should have sufficient understanding of the historical development of print materials of subject matter, etc., through research we found that prints the unique imprint technique of expression, and can be based on these to find the most can show their picture BanZhong, such as copper board or digital edition and so on, which requires the creation of the time to give full play to the subjective initiative.
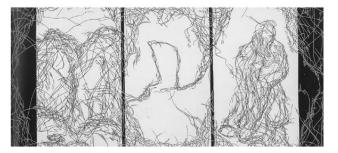

Figure 2: Engraving: One mountain, one water, one saint(left) and Engraving: Door god(right).

3.2 Artistic Elements "Visual Staggered" Print Innovative Design

Design process is very important in the illustration design, from sketch-to-sketch lines to adjust the final draft, it is essential to the process, according to preliminary extract the north during the Ming and Qing dynasties traditional wood engraving art characteristic, the illustration design decisions to goalkeeper characters as the main design objects, wood engraving traditional gene and the integration of modern elements and re-innovation. The first step of illustration design is the draft design, first of all, considering the size of the picture, the size proportion of the figure in the picture and the common character composition; Secondly, it considers how to use the underlying genes extracted from traditional woodcut, what kind of characters and graphics to use, and how to use similar genes to connect seven illustrations into a series. Finally, the preliminary line draft is completed through simple lines. The second step is to line the draft. Through the line language to carry out a preliminary review of the picture, not reasonable composition or graphics rectification, and then the final draft. The third step is to color the original manuscript. What we need to consider in this step is how to match the color genes of traditional woodcut in the Northern Ming and Qing Dynasties.

The figures chosen by the door god generally have the characteristics of exaggeration and realistic, and the color is mainly comparative color. The composition shows the balance of the picture in the form of symmetry. In the draft design, the tall and powerful figures of the door god in the traditional woodcut and the characteristics of bravery and majesty in battle are retained. Modern elements such as dice and electronic keyboard make the image of the door god more

playful and lovely than the characters in the traditional woodcut. The color draft is mainly colored with the six primary colors of the traditional woodcut supplemented by similar colors, and the final draft is presented in a way of visual interlacing. See Figure 3 for details.

Figure 3: Door god print art design.

Based During the Ming and Qing dynasties in the north of woodblock composition full enrichment, a boisterous from visual feeling, besides goalkeeper class wood engraving, symmetrical balance is a traditional wood engraving composition form one of the main forms of. Usually very obvious subject, big body small, often as a proportion of the surrounding characters and subject gap slightly larger, But from the visual effect proportion coordination Figure 4, for example, Kuan Yin is the Qing dynasty from green wood Masterpiece painting, one of the goddess of mercy as the visual center, were to screen stretched out around the design elements have administrative levels feeling and space feeling, still use center symmetric compositions, remove the body figure and minor characters, Supplemented by a variety of elements, further enrich the picture, enhance the visual impact.

In terms of innovative design of composition, the first choice is the size of A4 paper, and the figures are presented in the form of a single figure and object combined. Second, the layers and space of the picture are distinguished and processed through the modern line language, which is completely different from the traditional line language of woodcut in the Ming and Qing Dynasties in the north. There is a certain functionality and purpose, lines in illustration design, different lines contain different rhythm, the thickness of the orderly staggered lines can make the picture looks to have a certain sense of scale, the final innovative design of the picture from the visual experience of more strong impact. For example, the picture has a strong sense of overall volume, smooth lines without losing a sense of scale. The combination of organic and irregular shapes in the picture, the composition of square and circle also gives people a balanced and comfortable feeling.

Figure 4: Guanyin woodblock engraving of Yangliuqing in the Qing Dynasty.

The font logo design of visual interlacing makes the meaning of the text more visual, strengthens the language effect of the text, transforms the form of the text into visual symbols, and makes it easier for people to understand the design idea of the meaning logo of visual interlacing comes from the visual interlacing, and the font logo design is intermittently misaligned and blended the visual feeling, the color is novel and dazzling, the modern sense is strong.

4   ANALYSIS OF RESULTS

4.1   Computer-aided Handmade Soap Packaging Design

Paper is one of the most environmentally friendly materials, recyclability, less pollution to the environment, the subject of packaging materials for the paper. To complete research, and strive to the best results show the design work, the author uses the creation of box type: beginning of cartons Portable drawer box triangle box type window box Handmade paper packaging and other 6 forms. The expression technique of woodcut generally has a strong sense of texture. In the design of handmade soap packaging, the author uses the form of woodcut to interpret the picture. German printmaker Kaisy Kelehuich's woodcut is the author's enlightenment printmaker, Kelehuich is good at using simple and powerful lines to express the picture, through printing to form a strong contrast of black and white woodcut; Mr. Kang Jianfei, the famous printmaker, has a clever idea of color woodcut, full of decorative meaning, and tends to be implicit in painting style, focusing more on formal beauty.

In addition, handmade soap packaging design adopts manual printing of the outer packaging, so woodcutting tools are essential. The universal tool materials are wood cutting knives, paper, ink pigments, friction pens and other wood: Choose fine grain commonly, woodiness is uniform, the pear wood that board face is smooth and clean, bai guo mu, birch, jujube wood and basswood, the

3 plywood 5 plywood that makes with basswood and birch 7 close board effect is optimal, can choose contemporary engraving to carve according to oneself be fond of also to have the hemp that uses quality of a material softer edition.

Kedao: Japanese sword of wood carving knife or Japanese cherry blossom wood carving knife, such as managed to custom make a fine wood carving knife is better More than conventional woodcut printmaking with round mouth square opening triangle flat bevel five square opening knife mouth piece knife can be used to shovel large part, don't need to print bevel knife can be used to cut wood fiber, triangle knife to carve out the basic line. Paper: when printing black and white woodcut prints, rice paper is commonly used. According to needs, it is used to declare single or enclosed. Some people are also used to declare leather. Due to the large number of printing times and the large number of ink colors, professional printmaking paper is often used, such as CANSON watercolor paper ARCHES watercolor paper SOMERSET printmaking paper and so on. In short, printmaking paper, with good water absorption sensitive toughness dry after less discoloration is appropriate. Ink pigments: the daily use of pigment is Mali brand ink pigments, adding toning oil to control the consistency of ink when making ink. Friction pen: Mostly used for printing with marlins, many artists use spoonful of wooden mushrooms or other tools according to their preferences.

Packaging visual design is divided into two series of men and women, men were more likely color lenovo focus on abstract reason, while women of color lenovo is lay particular stress on perceptual representation Opposites attract, also let a lot of men tend to think of women in color lenovo things red yellow blue is the color of the three primary colors, three colors overlap can be black, and the beginning of all colors, The main color of this research is red, which represents women, and blue, which represents men, with yellow as an auxiliary color throughout. Coherent and story-oriented pictures are full of vitality, and more young blood and spirit are integrated into them. The visual language with story plots is hand-drawn under the handmade soap packaging of specific consumer groups, and the screen is carved with woodblock techniques to express the theme. For example, in the man gift box of the Creation of the World, nine small boxes are endowed with different pictures, including nine dynamic pictures of the male characters running, looking back and hesitating. The nine pictures are all woodblock prints. In the drawer type box, the author created the decorative pattern with Adam and Eve as the picture through the artistic technique of woodcut prints. Adam and Eve is the most typical representative of men and women, continuing the two themes of the male and female series of this subject. The pictures are symmetrical and unified, which can be put together into a complete print (as shown in Figure 5).

Compared with concrete objects, abstract pictures can convey spiritual resonance more. Duchamp said that art is either plagiarism or revolution. The author expresses natural phenomena through self-understanding with artistic techniques, and transforms ordinary scenes into a simple picture echoing the theme through imagination. In the hand-held box, open-window box, handmade paper box, the author creates the design based on roses and lilies in the form of woodcut prints. The flowers symbolize the softness and beauty of women, and the leaves surrounding the flowers symbolize the virility of men protecting women. The shape of flowers also gives people a sense of smelling the fragrance inside. The target group that this paper satisfies is positioned as: the youth group from 20 to 35 years old customized handmade soap. Packaging can be divided into the male Female two series, the use of print art design manual soap packaging when adopted different patterns of the same style of visual language to meet the young audience of 20 to 35 years old Women soaps, for example, used in the packaging design elements is strong and independent image such as red roses to express the concept of living of our country's modern women The packaging design of men's handmade soap uses images such as passionate blue lily to express the life concept of Chinese men.

Figure 5: TAN custom soap packaging drawer type box print display.

Women have relatively high requirements for aesthetics, and product packaging is more important when buying skin care and cosmetics. In contemporary society, women's life pressure is not lower than that of men, and modern women's life is more about being a good wife, mother and children after they become powerful in the workplace. Therefore, psychological pressure is targeted at women. For a series of handmade soap packaging design, the author created a pattern that can show the independent charm of women to complete the visual language; The main color is red, which is not only a representative color of women, but also a metaphor for grandiose society. The curvilinear imagery is a metaphor for women's self-image and social image. When the female audience in a specific group accepts the thoughts conveyed by the package, they will have purchase behavior. Faced with the packaging design of men's soap series, the author also created a pattern in line with male masculinity to express the picture. Following the modernism style of Bauhaus, Smith, van der Rohe, less is more to meet men's spiritual needs, the visual language of packaging will focus on men's unique forbearing, free and decisive temperament. The main color is blue, which is different from the packaging of women's series and highlights the extraordinary taste of men's elegance. The overall shape shows the beauty of male masculinity, showing the core value of simple life.

4.2 Computer-Aided Costume Design

The theme of this series of designs is called Street Corner. The main inspiration comes from some graffiti patterns on the streets, which seem random and disorderly, but they look very harmonious after the test of time. I designed this series of clothes with these random patterns, three sets of women's clothes and one set of men's clothes, October 2016 I participated in AOF International Fashion Design Competition and won the gold medal in the competition and had the opportunity to study abroad in Paris. The fabric I chose was made of woolen fabrics with different materials, different colors and different thicknesses, and then the printing was made of prints Process silk screen printing and wood engraving of two techniques of pure handmade rubbing, when to start preparing the manual printing done is to try a lot to explore, and finally select a print unique gel ink as main raw materials, rubbing this sort of raw material on the fabric don't change the fabric softness, not harden, is without ever printing fabric feels like the original quality As like as two peas And most worthy of people's surprise can be after high temperature ironing and washing, these properties is very suitable for the fabric, the fabric printing is digital printing and digital

printing of the fabric is very demanding, very limited, many fabrics can't digital printing, then the engraving art technology to realize many not digital print fabrics can be Since rubbing each wants the printing, and the mechanism sense is particularly strong, the use of mask and cover with gradient spray to create an unexpected multi-level texture pattern, splicing or tear painting texture and rearrange the combination formed in hand-painted abstract clothing design new works.

Figure 6: Graduation project is Street Corner Print.

As shown in Figure 6. Fashion with the artist's brush to produce unexpected spark, create abstract texture and organic print design, mechanisms are particularly strong, using a mask and covered with gradient spray create unexpected multilevel texture map, splicing or torn painting textures and rearrange the combination formed in hand-painted abstract print art new clothing design works. The biggest characteristic is the change of stroke lines, but lines are also very important in clothing design. Printmaking has diversified artistic characteristics. First, printmaking has unique creativity. Second, printmaking art has diversified.

The production process of Figure 6 is shown in Figure 7. The first is to choose what material do you want us to use the media to stereotype, the author choose here is the second board, is the best state will ink modulation must control the viscosity, cannot too thin nor too thick, third, will be printed on cloth on step by step, will we want to be the color of the drum roll, one layer printing, color of light color is the first part, fourth, is the printing cloth hanging drying, if there is no sun drying, it is basically difficult to finalize the design, this is a finalize the need for high temperature treatment of the ink material must be exposed to the sun, under normal circumstances and then sufficient sun, drying one to two days can be completely dried.

5   CONCLUSION

This paper studied the multiple computer-aided engraving art design in our country development present situation and prospect analysis, summed up the current, along with the computer aided design received widespread attention in the field of art design and application of technology, people attach more importance to computer performance rather than as a visual art of computer aided environmental art design should be more artistic characteristics. In order to get the development and progress of computer-aided print art design, it is necessary not only to master computer software technology, but also to make the works have artistic appeal.

Figure 7: Production process description of graduation project Street Corner.

First of all, in the performance techniques can be combined with a variety of techniques can be used to make its style unique; Secondly, cultivate and stimulate the creativity of designers, improve the comprehensive ability of designers, so that designers have a certain improvement in the design concept and artistic accomplishment; Finally, appropriate reform measures should be taken in the teaching of computer-aided environmental art design, so as to cultivate more designers with strong professional quality and artistic design knowledge to meet the needs of social development, and jointly promote the progress and development of computer-aided print art design.

Wang Lixian, https://orcid.org/0000-0002-9650-9850
Zhong Zhao, https://orcid.org/0000-0002-8239-4570

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