

Digital Empowerment Intangible Heritage -CLO 3D Virtual Fashion Design for Custom Clothing of Blue Clamp-Resist Dyeing

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Abstract:As the intangible cultural heritage of Wenzhou, blue clamp-resist dyeing has important cultural and economic value, but with the continuous progress of science and technology and people's concept, the development of Wenzhou blue clamp-resist dyeing technology has encountered a bottleneck. In this paper, CLO 3D virtual simulation technology is combined with Wenzhou blue clamp-resist dyeing, digital empowerment of intangible cultural heritage, and the realization of 3D human model establishment, 2D model module combination, virtual sewing, virtual pattern design, virtual 3D display and other research and development processes, so as to innovate The form of custom clothing design and display of blue clamp-resist dyeing is introduced, which reduces the product development cost of clothing enterprises and improves the efficiency of product design. At the same time, it also provides new ideas for the inheritance, development and publicity and display of Wenzhou blue clamp-resist dyeing.

Keywords:Wenzhou blue clamp-resist dyeing; CLO 3D; Virtual fashion design; Custom clothing

1. Overview of CLO 3D virtual digital fashion design

1.1 Research status of virtual digital clothing technology

The commonly used software in the garment industry mainly includes PS, CDR, AI, garment CAD software, etc. However, all of these software are two-dimensional digital software. Although they can present a good effect of garment graphic design, they cannot show a multidimensional three-dimensional wearing effect.

Three-dimensional virtual digital clothing technology fills the deficiency of two-dimensional digital technology, and well realizes the mutual transformation of three-dimensional modeling and two-dimensional flat paper pattern. It is a brand new design mode to show it through virtual stitching technology. In recent years, with the gradual application of 3D digitalization technology in enterprises, garment enterprises and system suppliers are increasingly aware that 3D digitalization technology is not only the application of software, but also the combination of software and hardware, which plays a role and significance in the digitalization wave of garment industry.

1.2 Advantages of CLO 3D software

CLO 3D software plays an important role in both clothing companies and students. Through 3D modeling, the complete outline of garments can be seen more intuitively, and the details of garments can be observed by placing them on the virtual human body.

At present, more and more clothing companies introduce CLO 3D software, CLO to create 3D clothing in a zero-cost way to create unlimited possibilities, designers can easily generate textures, color samples, flower matching and layout, etc. By viewing the modification effect of 3D clothing in real time, it can shorten the production time of conventional process and try-on samples, and reduce the production cost of clothing; Avoid verbal communication errors and repeated sample times; Reduce labor cost and improve production efficiency; For consumers, 3D virtual clothing can directly experience real shopping, which has a more direct visual experience and brings different shopping values to consumers.

Table 1 Advantages and characteristics of CLO 3D software

The serial number	Advantages and Characteristics	The specific content
1	Infinite design	Have strong simulation technology; Be able to create complex clothing and anything made from fabric.
2	Real-time rendering	Truly what you see is what you get; Simulates synchronously between 2D flat patterns and 3D views, and can modify designs in real time, checking garment shape and fit in real time.
3	Precise properties	By setting fabric parameters can accurately simulate its various properties, such as elasticity, resistance, thickness and so on; And you can change the fabric and color at will.

4	3D display	The display can take a variety of forms, from folding 3D garments or hanging them on hangers to create a showroom effect, to dynamic catwalk displays.
5	Multiple body type Settings	The software has 27 built-in human body reference points, which can be easily customized for any body type. The service objects can also be directly scanned into the 3D fitting software through the body scanner, so that the clothing can be customized more accurately.
6	Easy to learn	The operation tool is easy to use, as long as after a short training, it can be easily used.

2. Virtual Digital Design of blue clamp-resist dyeing Custom Clothing

2.1 Development and predicament of Wenzhou blue clamp-resist dyeing technology

As one of the national intangible cultures, Wenzhou blue clamp-resist dyeing craft displays the wisdom of working people from making indigo, making engraving plates to printing and dyeing. How to inherit and protect blue valerian has become a universal concern. With the continuous progress of science and technology and people's ideas, the position of blue clamp-resist dyeing craft is also changing quietly. As an intangible cultural heritage, blue clamp-resist dyeing has important cultural and economic value. However, the production of blue clamp-resist dyeing depends too much on manpower and weather, and the craft is difficult to inherit. In the style and shape are still conservative, stuffy, not fashionable, these characteristics have led to the development of blue clamp-resist dyeing encountered a certain bottleneck.

2.2 Blue clamp-resist dyeing fashion design

Wenzhou blue clamp-resist dyeing has unique artistic beauty, interesting patterns, implicit and simple colors and exquisite craftsmanship. Its rich forms of expression and unique cultural space play an irreplaceable role in retaining and displaying wenzhou's regional color, folk customs and regional culture.

At present, many designers in the market are activating the design of blue clamp-resist dyeing, mainly focusing on clothing and clothing products. However, the main reason why it is not popular is the lack of fashion and the single form of display.

2.3 Customized clothing virtual digital design

Custom-made clothing comes into being with people's clothing aesthetics and individual consumption consciousness. With the advent of the era of interaction, the use of virtual reality technology to virtual digital design customized clothing, on the one hand to protect traditional arts and crafts non-material cultural heritage, make the public more easily feel the charm of traditional culture, on the other hand, using virtual reality technology to fashion design, not only can improve the efficiency of product design, also can shorten the time of the clothing market, Reducing the cost of product development is the general trend of future development in the field of customized clothing.

The specific reasons are as follows:

First, the traditional custom clothing design process is complex and numerous, but the use of virtual digital technology can simplify the custom clothing design process. It takes about 2-3 days to make a sample, modify the sample, and repeat the fitting and modification for several times. Virtual digital design software is used to eliminate many unnecessary processes, save market costs and improve work efficiency to a large extent.

Second, for clothing designers, the introduction of virtual digital technology has provided great convenience for their work. As the designer designs the style on the virtual 3D model on the left, the corresponding 2D mode window on the right is also quickly adjusted. At the same time, customized works can be combined with various modules to form dozens or even hundreds of different clothing styles for customers to choose.

Third, virtual digital design software provides consumers with the possibility of remote customization of clothing. Consumers only need to provide three-dimensional dimensions of human body, designers can carry out custom clothing design, design patterns and view the modified results directly through 3D view in real time, and design and modify the paper pattern in 2D mode window, which can be output and printed by computer directly for production.

In a word, the digital technology of virtual clothing not only broadens the development path of digitalized clothing customization, but also promotes the upgrading and transformation of traditional clothing customization.

3. Virtual design and implementation of blue clamp-resist dyeing custom clothing

The following takes the blue clamp-resist dyeing custom cheongsam as an example to sort out the virtual design process and specific implementation steps of the blue clamp-resist dyeing custom clothing.

3.1 Virtual design process of blue clamp-resist dyeing custom clothing

Clothing designers use CLO 3D software to carry out the virtual design of blue clamp-resist dyeing custom cheongsam, which needs to be completed according to a specific work design process, which is mainly divided into the following 5 steps:

First, collect the customer's three dimensional size, create a human body model, set the parameterization of the human body model, the initial human body model can be based on the measured size of the human body, according to the change of the human body size corresponding changes.

Second, modular combination of blue clamp-resist dyeing custom two-dimensional model of cheongsam, in the model database of clothing modular virtual database to select the corresponding cheongsam component version, combination and adjustment.

Third, import the two-dimensional model of blue clamp-resist dyeing customization cheongsam, and use the virtual stitching sewing tools, set its suture to have done on the human body model, complete virtual cheongsam by 2D space to 3D space transformation, and the comfort of virtual cheongsam to conduct a comprehensive inspection, improve the overall quality of the virtual cheongsam design level.

Fourthly, after the transformation of the virtual cheongsam design, the designer can adjust the color and attribute of the blue clamp-resist dyeing pattern in the cheongsam.

Fifth, the final dynamic or static display of the virtual cheongsam design works.

3.2 The establishment of three-dimensional human body model

3D mannequin is an important carrier and key link of virtual garment customization. CLO 3D software adopts parametric surface modeling method to make the virtual Cheongsam show the real human body dressing state, and the overall shape and detail characteristics that can be displayed.

First of all, 3d body scanners or traditional manual measurement methods were used to measure the 3d dimensions of cheongsam custom customers, including height, chest circumference, hip circumference, waist circumference and other body shape data.

Secondly, virtual models with similar appearance and physical characteristics to cheongsam custom customers are selected, and matching hair styles, skin color and accessories are selected.

Finally, according to the previously provided three-dimensional human body data, relevant data required for the customization of the Blue clamp-resist dyeing cheongsam are set in the “Virtual Model Editor” to complete the establishment of the THREE-DIMENSIONAL human model, and the model posture is adjusted according to the customized style, so as to present a more real and rich clothing display effect. CLO 3D software covers 27 reference points of human body, including tall, short, fat, thin, big belly, broad shoulders, hunchback, flat feet, etc., which can be easily customized for any body type, thus effectively realizing accurate creation of three-dimensional human model posture and size.

3.3 Modular combination two-dimensional sample design

After the designer sets the corresponding 3D virtual model of human body according to the style of the customized cheongsam and the 3D size provided by the customer, it is necessary to complete the 2D sample design of the customized cheongsam with the help of the clothing modular virtual database established before. In the model database of garment modular virtual database, the corresponding model of cheongsam components such as sleeves, collar and body are selected, combined and adjusted in the garment CAD software, and the DXF file is exported.

3.4 Virtual stitching of two-dimensional template

The blue clamp-resist dyeing customization cheongsam model in DXF format of the imported into the CLO 3D software, and the first in 2D window position adjustment, improve virtual clothing and inosculation of the virtual model, and then use the virtual sewing tools to the shoulder seam, sleeves, front and back pieces and parts of virtual stitching, virtual suture after completion of the implementation of “analog” operation command, Virtual costumes and models are integrated.

3.5 Virtual design of blue clamp-resist dyeing pattern

The pattern of blue clamp-resist dyeing plays an irreplaceable role in the art of blue clamp-resist dyeing and transmits the long cultural deposits of Wenzhou. Generally speaking, the composition of manual printing and dyeing is difficult to copy, and the use of virtual digital technology can achieve the innovative design of blue clamp-resist dyeing pattern, to achieve the precise positioning and composition of pattern. First blue clamp-resist dyeing patterns can be subdivided, the application of virtual digital technology to generate the traditional blue clamp-resist dyeing cannot be expressed in the grain appearance effect, through graphic design software, such as PS, CDR software such as parameter optimization, to achieve accurate design of the composition, color and designs, then designed the blue clamp-resist dyeing patterns into the CLO 3D software, Add it to the custom-made Cheongsam of blue clamp-resist dyeing, adjust the corresponding fabric attribute parameters in the attribute bar, adjust the composition of blue clamp-resist dyeing pattern, details, structure and the overall shape of the Cheongsam to achieve the desired effect (as shown in Figure 1). The design with the help of virtual digital technology not only improves the design efficiency, shortens the pattern printing and dyeing cycle, but also realizes the effective saving of cost and resources.

3.6 Comprehensive display of virtual Cheongsam

CLO 3D display of 3D software function, from various angles can be either static, also can be realized through a form during dynamic interactive 3D virtual fashion show, the designer can through 3D display, check out the problems existing in the customization

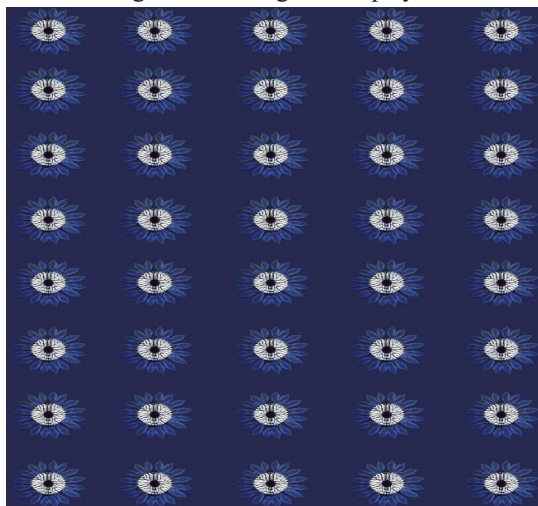


Fig. 1 Blue clamp-resist dyeing pattern virtual design

cheongsam, beneficial to the design work, makes the reasonable judgement for the next step adjustment and optimization, The result is the most complete (as shown in Figure 2).

3.6.1 Static display

The static display function in CLO 3D software can provide designers with 360° multi-angle virtual display effect of Cheongsam. The advantage of this form of display is that it can make an all-round evaluation of the overall shape, fit degree, draping effect of the fabric and matching degree of various components of the cheongsam, which is conducive to the modification and improvement of design defects. At the same time, the corresponding static display scene can be selected in combination with the design style of the custom-made Cheongsam of blue clamp-resist dyeing. On the one hand, the real display effect of clothes can be provided for customers, and on the other hand, a more detailed reference can be provided for the subsequent production of product albums.

3.6.2 Dynamic catwalk

In the state of motion, the human body has a demand for higher matching degree of customized clothing, so the dynamic display function of clothing in CLO 3D design software plays a very important role in product optimization design.

Dynamic display and subdivide the conventional dynamic display and dynamic show. Regular dynamic presentation can be complementary to static presentation. The designer sets virtual models with different poses according to the style of custom cheongsam made of blue clamp-resist dyeing, and records the dynamic display process into dynamic video, which is repeatedly modified and improved to achieve the effect desired by the final customer. Dynamic show also requires designers to determine the style and theme, design different show background, props, music, etc., to complete the virtual dynamic show of customized cheongsam. The advantages of dynamic show is very obvious, not limited by space, time, manpower, not only save a lot of manpower, material resources, financial resources, but also improve the efficiency of research and development, boost the digital production of clothing industry, and then promote digital empowerment intangible cultural heritage, innovation wenzhou blue clamp-resist dyeing display form.

4. Conclusion

In this paper, with the aid of digital can assign intangible, CLO 3D virtual reality technology as the core, to redefine the blue clamp-resist dyeing custom clothing design, by building a complete blue clamp-resist dyeing virtual custom clothing design process, for the clothing enterprises, provide enterprises with practical and perfect design and production, advanced customization fashion innovation new operating mode. Help garment enterprises to realize the information channel between designers, suppliers, manufacturers, consumers, shops and brands dredge, reduce the number of sample production and logistics transportation costs, shorten the production cost; For garment colleges and universities, students can intuitively learn 2D plane mode from 3D and quickly, and there is no need to purchase fabric, sew, iron and other tedious process in daily homework and sample clothes of graduation design exhibition, so as to effectively improve the quality of teaching work. As for blue clamp-resist dyeing, it innovates the design and display of blue clamp-resist dyeing, realizes the combination of tradition and modernity, and excavates the value of The Times.

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Fig. 2 Blue clamp-resist dyeing cheongsam virtual 3D display

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