Digitalization of Garment Design Based on CorelDRAW Software

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Abstract. The arrival of the digital information society has brought new opportunities for the development of apparel design. At present, the teaching content and means of the costume design profession have set up the CorelDraw software design course in different degrees and in different forms. Garment companies are also using the CorelDraw software design and their applications extensively. Corel DRAW software can clearly show the details of the style structure, stitching, and fabric in the costume design. Corel DRAW as a vector graphics software, there are many advantages in the application of clothing design. This article uses Corel DRAW X3 as the operating software, taking a practical example of a woman's skirt front style drawing as an example, focusing on the way of thinking and techniques expressed by Corel DRAW software in drawing clothing style drawings.

1 INTRODUCTION

Digital technology has won people's wide recognition in the fashion design community and provides space for painting designers. It has become a trend for future development. Digital technology has the advantages of high efficiency, accuracy, and convenience, relevant results proposed by Wu et al. [1, 2]. It is worth mentioning that it is highly efficient. This is particularly important in the future business operations. Qiu et al. introduced that Under normal circumstances, paintings in the traditional sense require the preparation of paints, papers, drawing boards, and pens, which are often subject to various restrictions so that they cannot be well developed [3, 4]. However, the use of computers is not limited by time and space. If it is necessary to change details or colors, paintings in the traditional sense need to be revised. Sometimes they have to be abandoned. However, clothing design on the computer can be easily completed, providing a variety of graphic design methods, special effects and colors, can freely carry out color, enlarge, modify, etc., improve the efficiency of apparel design, improve performance, relevant results proposed by Taylor et al. [5, 6]. Therefore, digital technology is extremely important in the development of fashion drawing.

Corel DRAW software, as a new information technology, takes computer as the carrier, through the reasonable presentation of the basic structure and fabric of the garment design,

optimizes the garment design effect, and it is more and more widely used in the garment design, relevant results proposed by Bulow et al. [7, 8]. More and more clothing companies also pay more attention to digital design, which not only improves the production efficiency of clothing companies, but also enhances the quality of apparel products, promotes the promotion of corporate brand culture, and promotes the development of enterprises. The application of Corel DRAW software in apparel design is mainly to determine the size of clothing, and to do a good job positioning the human model, to select the appropriate model, and modify the dynamic display model [9]. At the stage of garment design, the style, color, and fabric of the garment are designed, and the design of the garment is combined with the design effect of the entire garment to make the hairstyle design and the makeup design to reflect the optimized design and application of the garment style.

Therefore, this article uses Corel DRAW X3 as the operating software, taking a practical example of the front style drawing of a skirt as an example, focusing on the way of thinking and techniques expressed by the Corel DRAW software when drawing a clothing style drawing.

1.1 The Digital Performance of Apparel Design

The digitization of fashion design creativity has achieved breakthrough improvement in the artistic conception and dissemination of textile pattern design, and enriched artistic expression techniques [10]. It is an important revolution in textile pattern design. Using digital technology to design textile designs, designers can not only directly design clothing designs on the computer, but also can use the computer output media to directly print graphic designs or perform small-batch production after the drawings are completed. In addition, the designer's artwork can be transmitted over the network for remote production control. Practice has proved that digital technology is a tool for the majority of textile designers to maximize personal creativity. It can enable designers to fully demonstrate their talents and convert the most ideal works into physical products in a short period of time. The role of digital technology is also very prominent in providing personalized and fashionable textile consumer services to consumers. How to make computer-fixed programs and software systems and designers achieve human-computer interaction, especially when there are contradictions in the appearance of different designs, styles, fabric textures, and textile styles [11]. Break through the fixed traditional model to achieve the maximum space and imagination of re-creation and design applications. This is also the problem that textile pattern design needs to be truly digitized, and it is also a practical issue in the textile industry.

1.2 Applicability of Corel DRAW Software to Apparel Design

CorelDraw can perfectly represent fabric combinations and color combinations for various garments, allowing designers to quickly and arbitrarily design color schemes based on design needs. Therefore, today's fashion designers can use CorelDraw software to efficiently and quickly complete the design of clothing style drawings and costume renderings. CorelDRAW software features are as follows.

(1) Powerful drawing function. Due to the non-standard nature of garment mapping, the general geometry cannot meet the drawing needs. Therefore, the costume design software should be able to draw arbitrary curves, change the line style of any line, set the origin of the drawing arbitrarily, add any auxiliary lines, and satisfy the accuracy of data changes. Corel DRAW has the advantage of drawing arbitrary curves and changing the line style of any line.

(2) The arbitrariness of the settings is further divided into the arbitrariness of drawing settings, the arbitrariness of the unit and ratio setting, and the interchangeability of various file formats. Practice shows that Corel DRAW has all the requirements for digital clothing professional software. It can perfectly draw the clothing effect chart and express the effect of the clothing. In the style design, the stitches, fabrics, patterns and other details are close to the clothing effect. Corel DRAW is able to complete the drawing of a series of drawings for apparel design, to meet the digital clothing teaching and production software [12].

2   THE DIGITAL REPRESENTATION OF THE PERFORMANCE OF CLOTHING DESIGN

2.1   Technical Analysis of Corel DRAW Software for Drawing Clothing Styles

The technique of Corel DRAW software in drawing clothing styles is very practical. Table 1 analyzes its techniques from six aspects.

Skills	Skills analysis
Basic line drawing	Edit the basic prototype with lines, then transform the interactive deformation tool with a zipper, and finally push and pull the deformation to continuously edit the lines.
Line processing at the detail	The length, size, left and right, opening degree, shoulder width and sleeve link of the front sleeve and the placement angle of the sleeve need to be determined. The interaction of the line tool and the guide line is very important.
Lines are combined into a confined space	To apply a closed path, fill elements are drawn in the target area.
Combination line	Combine different elements, such as symbols, lines, images, etc., into any individual.
Adjustment of line proportion	Drawing style plans, craft drawings, printed embroidery patterns, a few people are also used to draw style renderings.
Line symmetry	By modifying the curve, length, neckline, sleeves, patterns, colors, the original clothes are designed to be dragged to form a variety of different clothing styles.

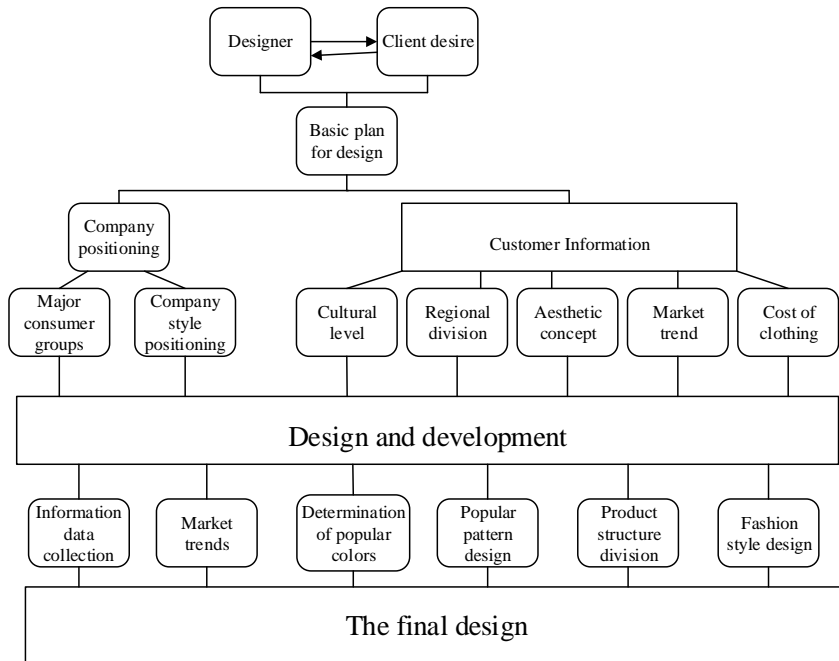**Table 1:** Technical analysis of Corel draw software for drawing clothing styles.

2.2   Fashion Design Ideas

The personality design in the clothing is actually the style design of the clothing. It is the unique creative thinking and artistic expression of the designer. It is also another interpretation of the modern fashion life. In this creative process, we must first analyze the logical structure of the clothing style design. The logical structure of the clothing style design is shown in Figure 1. Through the logic structure diagram of clothing style design, accurate access to the current popular information, market and customer needs, reasonable arrangements for the entire company's quarterly development and design to prepare adequate data information.
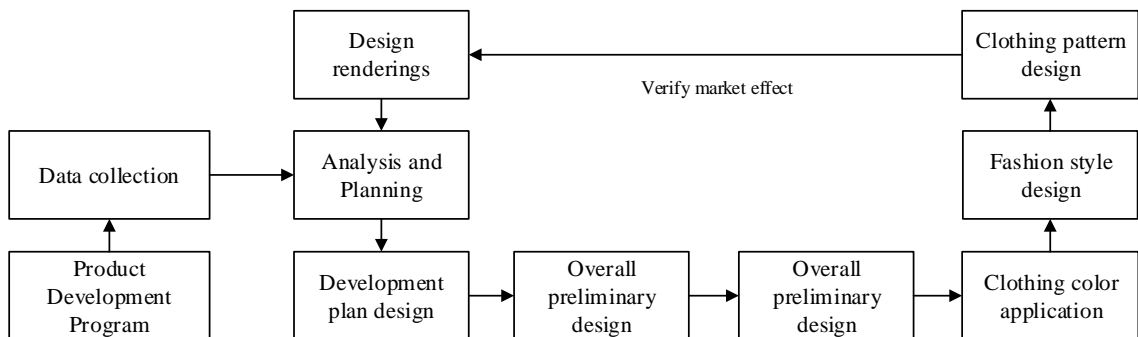
Secondly, the process of designing, analyzing, embodying, and validating the product development and design plan is gradually realized through the design process flow chart, and the design task of product development is finally completed. as is shown in Figure 2.

2.3   Practical Application of Corel DRAW Software in Fashion Design

In the design of costume design renderings, the application of Corel DRAW software color mode is shown in Figure 3. From the analysis of the use of apparel fabrics in apparel design, Corel DRAW software can contrast and set off different apparel fabrics and help fashion designers find more suitable fabrics. Corel DRAW software in the design of renderings, through the pattern, the clothing image, vivid design results presented. In the Corel DRAW software, there is an import function that can import photos of costume designers' own costumes into the costume design renderings. On this basis, the clothing is drawn, or according to the actual needs of the clothing style changes, the exchange of color, etc., so that the costume design renderings show an artistic effect.
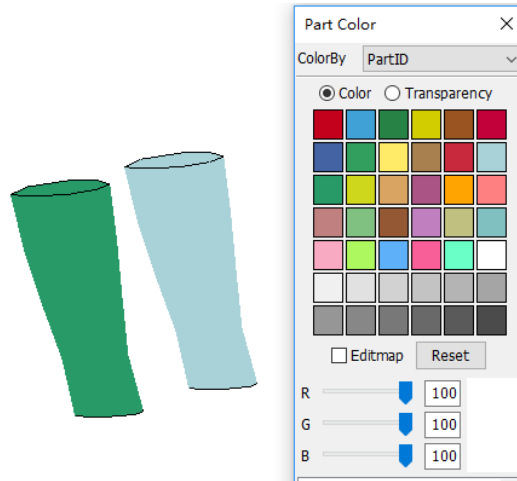
Figure 1: Logical structure of clothing style design.

Figure 2: Design process flow chart.

2.4 The Digitalization of Corel DRAW Software in Fashion Design

In clothing style design, Corel DRAW software will not be affected by the human body, do not need to draw it, can clearly show the lines and structures clearly and concisely. Under normal circumstances, the style design of the clothing is mainly based on the front, in the case of demand, the style of the back, side of the clothing will be drawn. Through the drawing function of Corel DRAW software, a rectangle is drawn according to the clothing length and clothing width of the clothing design, and then the rectangle is slowly converted into a curve, and the design of the clothing style is completed by using the tools in the Corel DRAW software to process the curve and the like. draw. When drawing a clothing style effect chart, the scales, paths, etc. in the Corel DRAW software draw the style of the clothing, and show the style structure before and after the clothing in detail, providing clear parameters for the production and production of the clothing.

Figure 3: Corel DRAW software in the color changes application of the sample.

Through Corel DRAW software, under the guidance of the basic principles and performance techniques of the clothing style effects, the final rendering is shown in Figure 4.
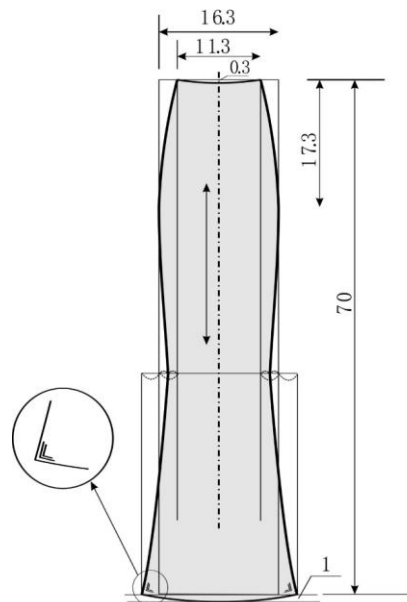

Figure 4: Apparel design effect using Corel DRAW software.

2.5   Corel DRAW Software in The Drawing of the Clothing Structure on The Digital Display

Use CorelDraw software's size, position, mirror, rotation and other functions, using drawing tools, according to any clothing drawing method, can be very accurately draw clothing structure diagram (as shown in Figure 5).

During drawing, note that each piece of parts must be closed separately so that it can be separated in the future. Use line tools to divide different lines according to the requirements. The

use of line tools and text tools allows easy data annotation, text annotation, and related symbol annotation. After the structure drawing is completed, a clothing model diagram should be made on the basis of the structure drawing for cutting and use. Each piece of the garment is to be separated, and seams, hems and other allowances are added to the edges of the component graphics. This model is independent, complete, and each template should be marked with code, number, warp direction. The drawing points are: Select a piece of clothing, use the software to change the size of the size of the function, directly enter the amount of data added after the margin, and then make one, put it in the lower part of the clothing, and then adjust the position.

Figure 5: Costume structure drawing using Corel DRAW software.

2.6   The Digitalization of Corel DRAW Software on the Garment Design Layout

The main purpose of discharge is to save materials and reduce costs. In accordance with the principle of large first, small, closely arranged, gap-combined, and size-matching, the material is laid out. In addition to the above requirements, the batch discharge should also set the number type ratio, calculate the length of the single-layer section, and calculate the number of layers. The need to pay attention to the process of nesting is the directionality of the fabric, including the direction of the warp and the fabric, and the direction of the reversed hair of the garment piece to be consistent, and the pattern and pattern of the garment piece should be consistent.

3   DIGITAL REALIZATION PROCESS OF CLOTHING DESIGN BASED ON COREL DRAW SOFTWARE.

This section takes fashion women as an example to illustrate how Corel DRAW software implements its digitization process in the fashion design process. Fashion, avant-garde is the overall concept of fashion pants design, using different design elements and design expression techniques can see different fashion frontiers. Fashion trousers are mainly targeted at groups of people between the ages of 18-30. They have the character of yearning for freedom, arrogance. They have their own subjective consciousness in their dress and seek clothing brands that can express their own personality. In fashion trousers, the overall style of fashion design is to add bold

and fanatical pop elements to the casual style. The personality design creates an alternative punk fashion for the young and discerning young customers. This kind of fashion will not be quickly forgotten and disappeared in the wave of fashion. Through the logical architecture diagram of the clothing style design, accurate access to the current popular information, market and customer needs, reasonable style of the design, to prepare sufficient data for the company's quarterly development and design positioning. Secondly, through the design process flow chart, the conception, analysis, reflection and verification process of the product development design plan is gradually realized, and the design task of product development is finally completed.
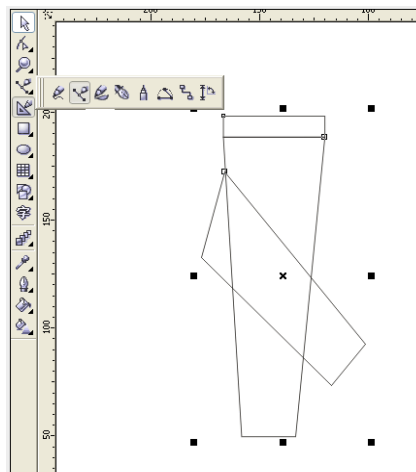
3.1   Design Ideas of Fashion Pants Based on Corel DRAW Software

Fashion women's colors are based on gray tones, and then add some fashionable pop colors. This makes the notes in the dullness beat on the fabric of the garment. The use of knitted fabrics, water-washed cotton, and denim can increase the personalization of the garment through the treatment of washing, worn-out, wrinkles, and holes. The style design of the garment adopts the processing method of dividing, splicing the structure. The whole of the finished clothing pattern is dominated by printing of various different techniques, combined with the combination of hanging dyeing, tie dyeing, printing and dyeing, nailing and other technologies. Adding a three-dimensional effect on the basis of the plane, let the monotonous trousers wear a stylish halo to feel the charm of fashion. The realization of the fashion design of fashion pants is realized by creating a flow chart: namely, the determination of the theme of the clothing, the collection of materials, the overall conception and the overall adjustment process, and finally the design of the digital clothing creation.

3.2   Implementation Process

Through the use of professional software to complete the design of fashion women's works, the specific implementation process is as follows:

(1) Start Corel DRAW software, create a new drawing file and name it "Fashion Pants Design". Use the [Rectangle Tool] in the toolbox to draw the structure of the clothing style by adjusting and editing the image lines. Then through the [curve] to adjust the line to make the body structure design more natural, then use the [selection tool], [Bessel curve] to complete the design drawing of the prototype (As shown in Figure 6).

Figure 6: The drawing process of the prototype.

(2) Click the small black button in the lower right corner of the left side toolbar [Rectangle Tool], select [Rectangle Tool], draw the pocket design of the pants, and make the details of the clothing more specific.

(3) After drawing the finished rectangle, directly convert the line into a curve, and click [Pen] to complete the line shape design. Then use the [shape tool] to frame the pocket, the same method for the design of the pocket.

(4) After completing the design of the left chest bag, use the [Selection Tool] to select the entire chest pocket and click the right mouse button to copy. At the same time, the copied pocket is structurally designed and the overall effect is adjusted.

(5) Find the [Bezier curve] on the right toolbar to draw the inner division design style line of the trouser leg. The same method of copying the pockets is used to draw the details of the trouser legs, so that the structural design of the sleeves on both sides can be completed in the shortest time.

(6) Select the fabric pattern required for the introduction, and perform precision cutting to complete the pattern and pattern filling of the sleeve to enhance the texture and visual effect of the garment.

(7) For the filled clothing pattern, use the magnifying glass in the [Zoom Tool] to adjust the pattern of the detail position.

(8) Transportation [Rectangle Tool] draws the contour of the pants by editing and adjusting the graphic lines, and further modifies the shape of the pants more natural.

(9) Click [Bezier Curve] to draw the waist detail and pants pocket, and adjust the curve to complete the pocket design. In order to make the inner structure of the trousers richer, complete the trousers sill design and draw a dotted line next to the structure line.

(10) Use the [Pen Tool] and [Shape Tool] to complete the detail design of the pants, and then use the [Select Tool] to select the internal structure of the pants. Press the 【】 key to copy the pattern on the right pants structure selected by the frame.

(11) Click the [Horizontal Mirror] button in the property bar to complete the design of the right symmetrical cuff. Open the fabric material and click [Effect] to expand the bitmap border. Add a fabric texture to the middle of the pants to increase the authenticity of the pants.

(11) After completing the fabric filling of the pants, select [Selection Tool] to select all the pants, and click [Arrange] to perform [Group] on the pants. This will allow the pants to vary in size and length. In order to better grasp the overall effect of the garment, the combination of the already completed tops and pants is combined.
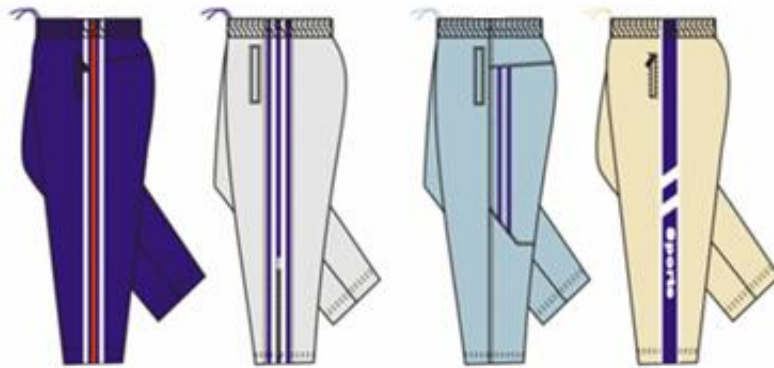
3.3   Display of the Final Product

Through the expressions of the above various tools and art, the designer's design intent and the overall style of the clothing are perfectly expressed. The expression of the fabric, color, pattern and other aspects of the clothing is also very perfect, the final design artistic effect is shown in Figure 7.

4   CASE ANALYSIS OF DIGITAL CLOTHING DESIGN BASED ON COREL DRAW SOFTWARE

There are many ways to express a costume design. Due to the unique program features and operating procedures of the software, the techniques presented are also unique. This article uses Corel DRAW X3 as the operating software, taking a practical example of the front style drawing of a skirt as an example, focusing on the way of thinking and techniques expressed by the Corel DRAW software when drawing a clothing style drawing.
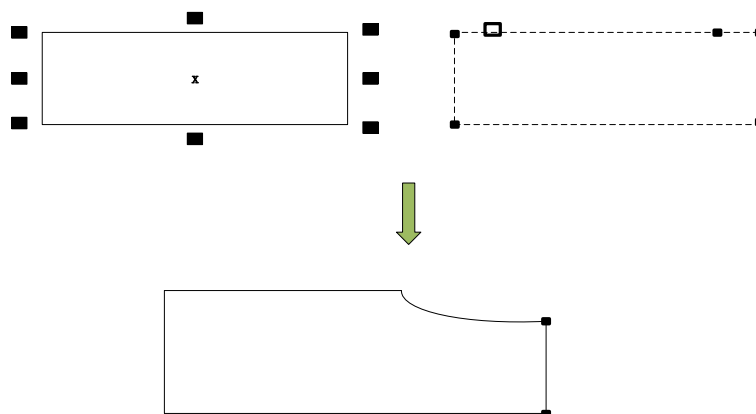
Figure 7: Display of the final product.

4.1   Difficulties and Solutions for the Realization of Number of Works

The creative design of the clothing style is mainly from three aspects: the color of the clothing, the design of the clothing style, the local and detailed design of the clothing. In order to achieve a better ideal effect when drawing styles in software, you need to split the parts of the clothing styles. Get a new work interface and data components, and then draw and assemble styles to get your own design. The problems that need to be solved in the design process are: When the online bar and the component are spliced, they cannot automatically find the dry contact point, that is, the splicing point; he style produced by the lines and bumps needs to be strengthened and improved in terms of practicality and artistry; The use of pictures and graphics during the use of the software requires constant conversions to make it easier to keep online and digitally.

4.2   Drawing of Basic Group Types

Start the software and create a new drawing file named "skirt." Use the "Rectangle Tool" in the toolbox to draw a picture of the clothing style structure by adjusting and editing the image lines. Then through the "curve" of the adjustment of the line to make the body structure design more natural, and then use the [selection tool], [Bezier curve] to complete the basic body type drawing. As shown in Figure 8.
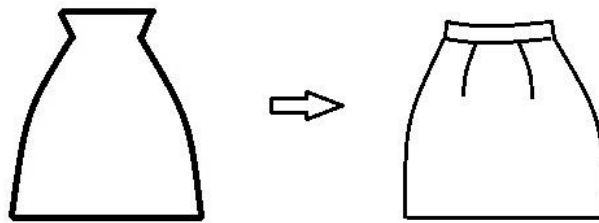

Figure 8: Basic group drawing.

4.3 Dress Modification and Touch-up

Click to open the execution window, "Menu → Docker → Transform → Proportional and Mirroring Commands" and make the appropriate settings. After the settings are complete, click Apply, and then use mirroring to complete the other half of the skirt to make the tool move to the appropriate position. Run "Window Menu → Docker → Trim Order" to find the welding order and weld the two skirts together.

Then find the "Bessel tool" in the toolbox and click on it, and then create the waist shape on the waist. Find the "shape tool" and click to adjust the skirt hem so that it has a certain degree of curvature (as shown in Figure 9).

Figure 9: Modifying the skirt with Corel DRAW software.

4.4 Use "Block mode" to Fill the Parts of the Skirt

The use of "block mode" refers to the filling of individual block faces with different shades of gray, which can lay a good foundation for the expression of the following style pictures. As an example of the color padding of this skirt, it is possible to fill the dark gray-filled rear skirts with low lightness levels, fill the front skirts and sleeves with light gray with a high lightness rating, and fill the collars with gray with moderate lightness levels. On the other hand, it is possible to directly convert the perspective diagram of a style chart into a visual style chart. If you find that the level of confusion in the filling process, you can click on the need to adjust the color of the tool to call the level change dialog box, flexible changes.

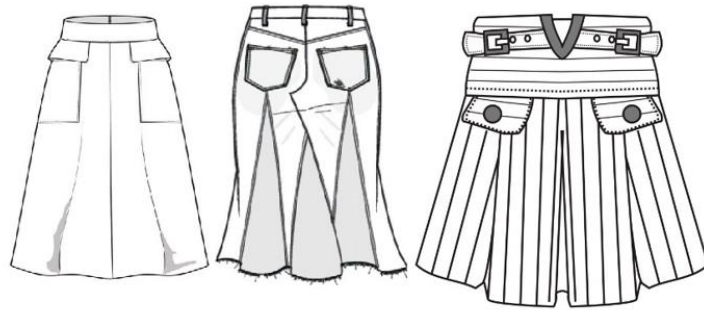### 4.5 Using the "Group function" to Improve the Style of the Skirt

Take the skirt line as an example. This skirt includes contour lines, dividing lines, pleat lines, decorative lines, and so on. There are various line changes and there is no uniform thickness standard. When editing these different types of lines, the color, shape, and thickness of the lines can be adjusted and modified. For the convenience of operation, you can use the formal beauty rules, select the same line group, and perform unified editing. Line type changes can be edited using the shortcut key "Ctrl+Shift+Q". First, the basic lines of the skirt are converted into curves. After entering the shape tool, the nodes of each part are adjusted and the thickness and shape of the lines are adjusted.

4.6 Finished Style Effect

The complete artistic effect design of the completed style figure of the skirt is shown in Figure 10. Click [File] to save the graphic format.

5 CONCLUSIONS

In the field of fashion design, Corel DRAW software has been effectively applied as a new type of drawing software, so that the problems and deficiencies in the traditional manual dress design drawings are reasonably compensated.

Figure 10: Finished style image of the skirFt overall artistic effect design.

The application of Corel DRAW software in apparel design has many advantages. It can quickly improve the efficiency and design quality of apparel design. The current Corel DRAW software has been scientifically validated in foreign apparel companies, effectively promoted and utilized. From the status quo of Corel DRAW software application in China's apparel industry, the use of Corel DRAW software in apparel design is the result of advancement of social information technology and computer technology, as well as the development direction of apparel design. It is also a future trend.

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