

Color Motion

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Keywords: Optical illusion, wearable art, laser cutting, textile innovation

Optical art is a form of visual expression that is created by lines and shapes in sharply contrasting tones of black and white, or in subtle hues of color, on a physically static background (Lancaster, Palmer & Cowdell, 1973). Since the 1960s, optical illusion theories have affected the fields of fashion and textile and appear on works by renowned fashion designers' such as Jean Paul Gaultier, Kansai Yamamoto, and Gareth Pugh (Agac & Sakarya, 2015). The initial goal of this wearable art design, *Color Motion*, was to explore more possibilities on creating optical illusion motifs with textiles in three-dimensional space. The design purposes for creating such wearable art were to: (a) experiment with the weaving combinations of different texture fabrics in four sequential color tones (black, dark grey, light grey, and white) to create the effects of an optical illusion, (b) apply optical illusion patterns to contemporary garments using innovative technology, such as laser cutting, and (c) transfer the two-dimensional optical illusion patterns into three-dimensional wearable art to enhance the visual effect on body shapes.

There were two optical illusion images that were adopted as inspirations for this wearable art. "*Color Motion 4-64*" (see Figure 1) was created by oil painting on canvas by American artist Edna Andrade in 1917. The image represented the key feature of the Op Art, which involves "placing a binding emphasis on perception" (Parola, 1969, p.9). Figure 2 shows a digital art work "*Nested Spaces iii*" created by Mexican artist Ramiro Chávez Tovar (Evilskills).

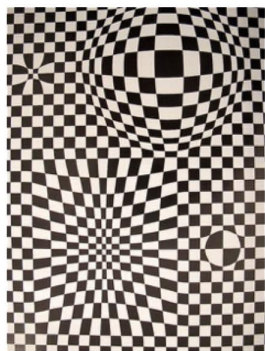


Figure 1. "*Color Motion 4-64*" by Edna Andrade

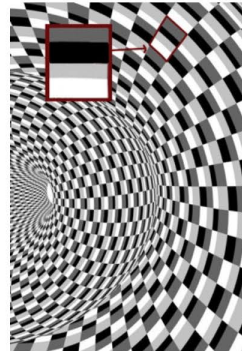


Figure 2. "*Nested Spaces iii*" by Ramiro Chávez Tovar (Evilskills)

This work perfectly shows the advantage of digital art work, which carries strong color motion and a perspective effect in sequential color tones. The reason for choosing the art piece "*Color Motion 4-64*" was to clearly express two major optical perspectives: protruding and caving in. Figure 1 presents squares that gradually grow larger from the rhomb outline to the center, and become increasingly smaller from the quadrature outline to the center. Figure 1 is the reference resource for the main concept of the pattern, and Figure 2 provides ideas for color combination to achieve strong visual effects. For this project's design, laser cutting technology was used to create the optical illusion patterns by weaving and inserting different fabrics into the engineered cut shapes.

The first step of this project involved designing the structures and silhouettes. In order to achieve strong contrast and perspective effects of the optical illusion patterns by utilizing body shapes, the designer draped the dress on a half-scale size 8 women's dress form with one piece of muslin. The fabric was shaped with seven darts around the waist line. The organic shape of the fabric was kept to create a symmetrical hem shape. In order to demonstrate the aesthetic of the optical illusion patterns, the skirt was constructed to look fuller by increasing the amount of the dart measurements. In addition, the laser cutting patterns were easier to use with the one-piece pattern than the multiple smaller pieces. Once the prototype was finalized, all the half-scale patterns were digitized into the Lectra Modaris Classic 2D V8R2 and then modified and amended by adding ½ inch seam allowances. The patterns were scaled up to

the full size in the Modaris and then converted into DXF files to be opened in Adobe Illustrator to draw all cutting paths for the optical artwork onto the pieces.

The designer found regularity in the digital work “*Nested Spaces iii*,” which divided black and white squares at two fifths of each into four parts as one repeat unit, and incorporated this into the current project. In order to add digital effect to “*Color Motion 4-64*,” all of the black and white squares were divided into two parts: two fifths on the top and three fifths on the bottom (see Figures 2 and 3). After testing ten different fabrics, four fabrics were selected for layers by sequential color tones for matching cutting shapes: black premier velvet, dark grey casa crepe, light grey casa crepe, and white casa crepeback satin. The cutting patterns were engineered on each layer of the fabric. As you can see in Figure 3, the patterns in each layer crowded together from the Layer 1 to Layer 4. Each layer has a specific cutting shape sequence. From the second layer to the fourth layer, all cutting lines were in a similar “U” shape with comparable perspective, but in different sizes. Four layers of fabric were laser cut using a Universal Laser Cutter with 60% speed, 100% power, and 1000 PPI, along with the red lines in the Figure 3. The dart lines and the stitching lines were engraved with 70% speed, 20% power, and 500 PPI for the black velvet, while the power of engraving on the other three fabrics was reduced to 5%. The designer used tweezers to push the cut “U” shapes of the second to fourth layers through the corresponding holes on the first layer. The rest of the garment pieces were also cut by laser cutter on black velvet fabric. The garment was assembled with four layers of fabrics. The collar and the back draped piece were folded inside out to demonstrate another an optical illusion effect with colors and patterns contrasting the outer layer and using the same fabrics.

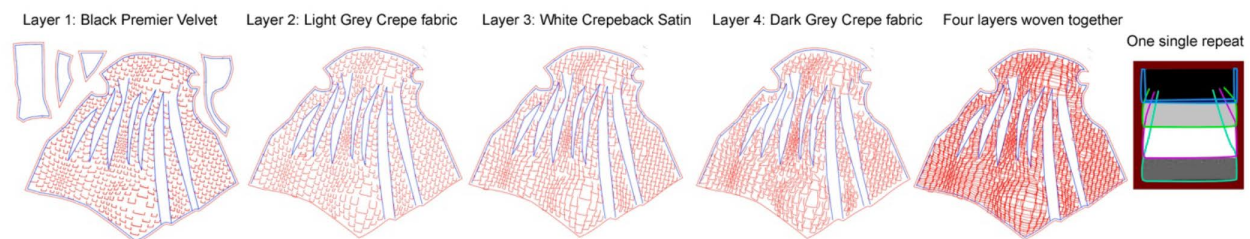


Figure 3. Adobe Illustrator file for laser cutting

This wearable art piece exhibits an innovative textile design using laser cutting technology to transfer two-dimensional patterns and color motion into three-dimensional textiles and garments. The final garment serves as a physical record for both artists and designers to learn about the aesthetics of optical illusion theory.

References

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Figure 1. Front view



Figure 2. Back view



Figure 3. Side view



Figure 4. Detail view