

Nature's DNA

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Keywords: Digital textile printing, Modaris pattern making, Kaledo textile design

The goal of this design, *Nature's DNA*, was to explore utilizing apparel design as a communication tool to represent the relationship between fashion, the human body, and natural scenery. The question we asked was how we can aesthetically appreciate the natural environment and how can we express the conceptual and material values of the relationship between fashion design and natural scenery through the application of digital textile printing, digital pattern making, and print pattern designs.

Biologists and naturalists agreed that human beings have an inherent connection with nature (Lee et al., 2015). Natural scenery has the ability to induce psychological benefits such as reducing human's stress, improving attention, and increasing longevity (Grinde & Patil, 2009). Thus, it is a primitive desire of humans to appreciate the beauty of nature's creation. *Nature's DNA* is a design part of a larger collection inspired by the aesthetic of the natural parks in the United States. Upper Antelope Valley, where the first author visited in 2016, is a part of the Navajo Tribal Park in Northern Arizona. The park was named by Navajo Tsé bigháníliní, which means "the place where water runs through rocks." The sandstone of Antelope Valley has been carved by wind, sand, and rainwater to form a unique, tight slot canyon. After thousands of years of carving, the rock was transformed into flowing shapes with the smooth edges. The main purposes of creating this design were to: (a) explore methods for creating textile prints using computer-aided design software and Lectra Kaledo based on photographs of the Upper Antelope Valley from the first author's own photo collection and (b) utilize the structures of pattern making to express the flowing textures on the rock.

The first step of this project was designing the textile patterns. The goal of designing the textile patterns was to maintain and emphasize the flowing texture of the rocks to create a unique pattern that represents the beauty of this particular natural location. Two photographs of the rocks were selected to create the textile prints, matching shadows and light reflections on the rocks. The designers used Adobe Photoshop to alter the images and colors to achieve the high quality of textile print and a necessary color contrast. As shown in Figure 1, the size of the bottom image was set at 35" x 23." The size of the top image was changed to 15" x 10." In order to blend the two images together, the blending mode of the top image was changed from "Normal" to "Difference," allowing the sheer of the top image. The sheer image was moved around to match the most appropriate texture the bottom image. After merging the two images into one layer, the designers used a rectangular marquee tool to select the outline of the top image and delete the inverse selection area. By adjusting the colors of the image according to the colors of nature -- green, blue, turquoise, and dark red (rock colors) -- the image input levels were adjusted in terms of shadows (14), mid-tones (1.11), highlights (172), color levels (-33, -1, -2), and mid-tone color levels (-53, -31, +3). There were several options of textile designs using different combination methods and color contrasts. Two were selected for the final prints for the dress and jacket. Then, two initial prints were transferred into Lectra Kaledo for modifying the colors and the shape of the motifs, and creating repeat patterns. The original images, carrying the essence of nature's beauty, were rotated and flipped and converted to the never-ending entanglement of the DNA double helix, giving rise to the title of the design (see Figure 2).



Figure 1. Merging two layers.



Figure 2. One of the textile designs.

Once the textile prints were finalized, the designers digitally printed the patterns onto a variety of the silk fabrics and cotton fabrics for testing. The 100% silk charmeuse (22mm) and 100% silk organza (15mm) fabrics demonstrated the best performance of the quality of the prints compared to other printed fabrics. The jacket and the one-piece strapless dress were draped onto the size 8 manikin. The structure of the collar on the silk organza jacket was adopted from an unconventional design technique, incorporating a vanishing lapel from Nakamichi (2012), included in order to utilize the organic silhouette of the collar to minimize the usage of the fabric and enhance the visual integrity of the garment construction. The arch shape on the back of the jacket represents the shape of the caves in the Upper Antelope Valley. All garments' flat patterns were digitized into the Lectra Modaris Classic 2D V8R2 and then modified for accuracy for digital textile printing. The final flat patterns were converted into DXF files to be opened in Adobe Illustrator to engineer the prints onto the pieces (see Figure 3).



Figure 3. The engineered patterns.

In order to emphasize the beautiful print of the dress, the whole jacket was made of the 15mm silk organza, enhancing the contrast of solid sheer fabric with printed, non-transparent fabric. The peplum hem of the jacket was formed by nineteen layers of the silk organza. Each layer was cut a quarter inch shorter than the layer below. By adjusting the sewing position on the waist edge of each layer, the hem of the layers resembled differentiated waveforms to mimic the flowing shape of naturally eroded rocks in Upper Antelope Valley. The repeat prints on the shoulder of the jacket fade into solid dark red above the bust line to highlight the print of the one-piece dress. Dark red glass beads were used on the hem of the long collar and along the edge of the sleeve cuffs to add weight to the fabric and embellishment to the garment.

This design demonstrates a successful design process, translating representational photographs of natural scenery into non-representational textile prints. The silhouette and structure of the garments are integrated with digital textile printing technology by strategically planning intricate digitized pattern pieces and the textile prints. This design achieved the goal of expressing the aesthetic of nature through the creative process and the final garments.

References:

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Figure 1. Front View



Figure 2. Back View



Figure 3. Side View



Figure 4. Detail