



## The Chaotic Beauty of the Pure Palette

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Note: Please view the design process via the online PPT:

<https://view.genial.ly/646662f1869b5d0012f42584>

The primary objective of this creative design research was to integrate chaos theory as a foundational framework, effectively harnessing the dynamic interplay between laser cutting, minimal waste patternmaking techniques, and innovative surface design with multi-material applications. The design project posed notable challenges that revolved around two critical aspects. Firstly, it aimed to determine the most suitable fabrics and materials that could effectively bring the envisioned surface design to life. This involved a meticulous exploration to identify the ideal components capable of achieving the desired artistic expression. Secondly, the study sought to ascertain the applicability of chaos theory as a foundational concept in wearable art design, all while ensuring a cohesive and harmonious composition despite the incorporation of diverse materials. Striking a delicate balance between artistic experimentation and the inherent complexities of multiple material integration was a key objective of the research.

Chaos theory represents a significant paradigm shift, following in the footsteps of quantum mechanics (Jiao, et. al., 2013). It sheds light on the intricate dynamics of nonlinear systems, revealing their inherent random behavior within uncertain and complex conditions (Schuldberg, 2011). The fundamental principle of chaos theory asserts that order can arise from disorder, and there exists a deterministic unity within seemingly random phenomena (Hayles, K., 1991). When considering the process of apparel design research, it becomes apparent that it operates as a dynamic system characterized by inherent chaos, which manifests through non-periodic and seemingly erratic movement patterns in its steady state (Jiao, et. al., 2013). This recognition highlights the complex and dynamic nature of the apparel design process, wherein designers navigate a multifaceted landscape influenced by chaos theory's principles. One of the notable designs showcased at the ITAA exhibition was "Organized Chaos" (Sanders, 2016), which skillfully incorporated the principles of chaos theory into its design process.

This wearable art design drew initial inspiration from the captivating work of Liz Sofield, an artist known for her paper and ceramic creations, particularly the artwork piece titled "Twisted Rhythm 2". The designer was deeply fascinated by the artist's innovative use of white paper and thread, achieved through meticulous folding and stitching techniques. Intrigued by the possibilities, the designer embarked on an experimental journey to explore the application of these techniques in garment design. The first step of the project entailed thorough testing of various fabrics, threads, and cutting methods. The overarching objective was to minimize waste throughout

the wearable art design process. To achieve this, the designer sourced fabrics from donated collections available within the university's apparel program. Five different fabrics underwent careful evaluation based on specific criteria: 1) ensuring that the fabric maintained its original properties, such as no shrinkage, color alteration, or melting, after undergoing laser cutting, 2) providing adequate support for the surface design, and 3) allowing for effective folding to emulate Liz Sofield's artwork.

Using Adobe Illustrator, a template of 3-inch diameter circle was created, serving as a consistent shape for testing. Each of the five fabrics underwent laser cutting to produce circles. Ultimately, the cotton blend fabric in an elegant ivory color was selected as the final choice. It met all three criteria, in addition to offering a delicate and supple surface, capable of highlighting the intricate shadow effects of the surface design. To prevent fraying along the cut edges of the circles, fabric stiffener was applied to both the cutting edge and the wrong side of the fabric, reinforcing its strength and durability. In parallel, the designer explored a range of thread options to find the most suitable match. After careful evaluation, the American Maid™ cotton yarn in a natural white shade (20/2 yarn size) was chosen. This selection was based on its sustainable features and the minimal likelihood of fiber loosening during the sewing process, ensuring longevity and structural integrity.

The overall silhouette of the coat drew inspiration from the iconic 1950s A-line coat by Christian Dior, while the garment's pattern-making process was influenced by the minimal waste approach outlined in the book "Pattern Magic 2" by Tomoko Nakamichi (2011, P. 35). To begin, the initial garment patterns were drafted at a half-scale and draped on a size 6 half-scale dress form. Considering the objective of highlighting the beauty of the surface design, the initial patterns were tailored for a knee-length coat. As depicted in Figure 1, the center back seam of the coat was cut on the fold, measuring 57 inches. The center front seam mirrored the length of the center back seam. Two small gusset panels, forming isosceles triangles, shared the same length as the side seam of the coat (35 inches). These gusset panels were attached to the front side seam of the coat, while the larger gusset panels were attached to the back side seam.

To ensure ample room for the underarm area, an underarm and side seam panel was created. The sleeve, front panels, and back panel were seamlessly connected to form a one-piece pattern. To fill the gaps within the 57-inch by 57-inch square shape, 3-inch circles and 1.5-inch circles were strategically incorporated (refer to Figure 1). Eight dots were marked on the circles to serve as stitching points for easy and accurate positioning. A fabric piece measuring 115" in length and 58" in width was folded in half and precisely laser cut. After laser cutting the patterns and circles, the designer proceeded with embellishing the surface design before assembling the garment adopting the same techniques from Liz Sofield's artwork. The circles on the garment were carefully positioned by hand, adhering to the principles of chaos theory. Their placement was deliberately orchestrated to blend both order and disorder, resulting in a visually captivating

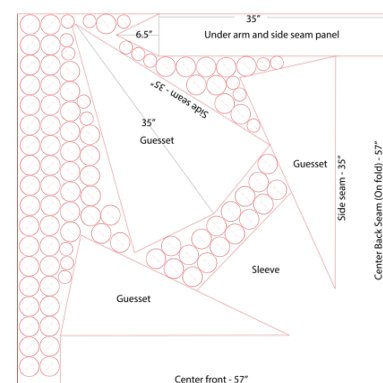


Figure 1. The garment pattern for laser cut

complexity. In order to elevate the visual appeal and intricacy of the resulting patterns formed by the thread, the designer strategically utilized paper squares to fill some gaps or empty spaces adjacent to the circles. This approach facilitated precise stitching around the circles, guiding the overall stitching process and augmenting the overall aesthetic complexity.

This design project serves as a compelling testament to how the integration of chaos theory as a design methodology has opened new avenues for artistic expression in the apparel design domain. The design process for this wearable art piece was a non-linear journey that involved numerous iterations, extensive testing, and experimentation procedures. It has not only contributed to expanding the knowledge base within wearable art design but has also highlighted the value of combining research, tacit knowledge, and the designer's expertise to drive innovation in the field. The exploration of chaos theory, the incorporation of cutting-edge technologies, and the fusion of artistic elements have collectively resulted in a unique and impactful contribution to the existing body of knowledge in apparel design. The future design will be centered around the exploration of diverse geometric shapes and innovative stitching methods, aimed at cultivating highly distinctive surface designs that are firmly rooted in the principles of chaos theory.

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