Scent of Permanence
Application of Fibonacci rose for a Naturally Dyed, Zero Waste Design

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The purpose of this project was to develop an avant-garde garment with zero fabric waste that considered the textile design in conjunction with the garment design. The Fibonacci rose sequence was used as the method to guide design cutting and hand-painting with natural dyes as the coloration method.

During apparel production about fifteen percent of fabric ends up as textile waste on the cutting room floor before it is transferred to landfills (Rissanen, 2013). Efforts to reduce pre-consumer textile waste include increased marker efficiency, recycling processes, and reducing waste including zero waste design. Zero waste is not a new concept, as many cultures throughout history handled woven textiles as precious commodities and utilized the entire textile in clothing the body. However, efficient textile production technologies of the industrial revolution reduced cost and increased volume of textile production, in turn reducing fabric's economic value and acceptability of fabric waste (Rissanen, 2013). The concept of zero waste fashion design ultimately aims to produce garments with no fabric wastage. This project adopts Rissanen's and McQuillan's definition (2016) of zero waste fashion design, "fashion design that wastes no fabric, by integrating pattern cutting into the design process" (p. 11).

This project was underpinned by the research through practice framework (Bye, 2010). This project did not include analysis at this point since it is a short exploration project; however, the literature review informed the initial part of this practice-based research including design ideation and decision-making throughout the exploratory design process.

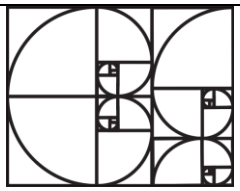
The Fibonacci Sequence, also called Fibonacci Rose, is a pattern of numbers generated by a particular rule (Dunlap, 1997, p. 37). "It starts with 0 and 1; these two numbers are added to get 1, then the new 1 is added to the previous 1 to make 2 (Minarova, 2014)". To achieve balance, harmony and beautiful results, artists, architects, designers, have been long incorporated the Fibonacci sequence proportion. However, Minarova (2014) noted limited use by textile and fashion designers. Julieta (2016), in her project-based research, created textile designs that were inspired from the Fibonacci rose spiral incorporating Bulgarian symbols and ornaments with mirror, radial and symmetrical repeats. Similarly, Kazlacheva (2014) applied the Fibonacci rose to textile design along with style lines of garments creating versions of the Fibonacci series tiling. On the other hand, Vereshaka (2014), used the golden ratio as a design tool for knitwear pattern cutting.

The Fibonacci Rose or Sequence of proportion is infinite, yet the symbol of beauty for this concept, the rose, has a short life. Thus the rose, with its contradiction of spiraling infinity and

short life inspired this project. By focusing on the infinite beauty of people and planet we embrace sustainable behaviors, especially in making decisions related to apparel production and consumption. The Fibonacci Rose concept was applied to pattern design using the sequence of numbers to make three differently sized patterns of Fibonacci Roses.

Minimum cutting and no cutting are two draping methods of zero waste design (Carrico & Kim, 2014; James, Roberts, & Kuznia, 2016). These methods include zero to minimal slits in which the final design outcome and silhouette are not determined by the outline of the pattern. In the minimal cut practice, draping plays a dominant role in creating the design as the pattern pieces are intact and are not pre-determined. The Fibonacci rose sequence guided the decision making of minimum style cuts along the spiral and no fabric waste garment design. Design options were explored initially in muslin by draping on a dress form with the rose created from three spirals. Scrap pieces were used for facings, closures and in areas needing support.

Process



1. Pattern generated using Fibonacci Rose sequence.

2. Transferring design to fabric (left), Painting before (middle) and after (right) steaming

3. Draping the mock-up muslin on the dress form.

4. Hand-stitching in the rose (left), hem hand sewn (Middle), scrap pieces used for couture covered snaps

Final outcome

References

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