

## Transformative Bloom

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Modular design is a design approach that features small standardized units that can be independently combined in various configurations to create different forms and provide multiple functions. As a concept, modular design has been explored by textile and apparel designers. For example, the Fragment Textiles designed by Soepboer and Van Balgooi developed two small wool forms, squares and stars, which were assembled to create a fabric (Stam & Eggink, 2014). In addition, modular design has the potential to be ubiquitous through the ability to transform and create a beautiful utilitarian experience for any circumstance. For example, researcher Eunsuk Hur explored active user engagement practice in the design process through modular design. Each set of textile pieces can be rearranged to transform one item into various other hybrid designs including hats, dresses, bags, scarves and interior accessories (Hur, Cassidy, & Thomas, 2013).

This design was a part of a cross-disciplinary creative collaboration between an apparel designer and printmaker. The purpose of this partnership is to explore transformable design by integrating the concept of modularity and engineering prints, which feature continuous tiling of artwork. Inspired by hydrangeas, the themes of sustainability and transformation were explored and embodied through the design and the concept. Hydrangeas are hyperaccumulator plants that remediate soils contaminated with heavy metals. Their color changes depending on the contents of the soil (Chalker-Scott, 2009). The challenge of this design was to create modules that can not only be combined independently in a variety of ways to create garments or accessories, but also function as closures to join engineering printed fabrics to create dynamic and changeable surface designs.

The process started by developing two modular shapes inspired by hydrangea flowers on Adobe Illustrator. For Module Design I, a flower shape was created representing the outline of hydrangeas. Slots on each of the petals of the module were carefully positioned. As demonstrated in Figure 1, the module was interlocked together to create different shapes. Module Design II, shown in Figure 2, was inspired by the petals of the hydrangea. Waste reduction was a key component when developing this module. Therefore, a wavy line was placed in the center of a rectangle to create two pieces at the same time, differentiated by blue and gray colors. This ensured minimized waste was generated on the end of the two pieces. After slots were added on each petal, the two pieces were interlocked serving as a closure as shown in Figure 2. The length of the rectangle can be adjusted as needed.

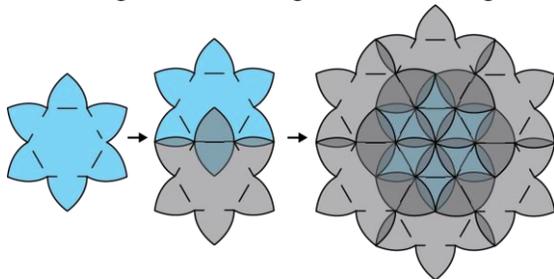


Figure 1: Module Design I and the interlocking method.

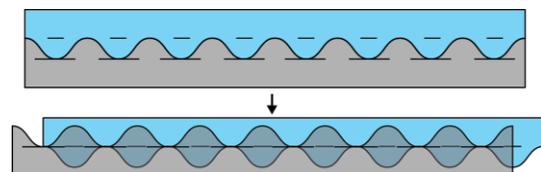


Figure 2: Module Design II and the interlocking method.

After Module Designs I & II were developed, white faux leather was used to cut all the shapes on a flatbed plotter machine. Five different sizes of the Module Design I shape were used, resulting in increased complexity of the final design. For this particular design, a bolero jacket was formed with the Module Design I from smaller shapes on the neck and gradually changing to bigger shapes on the hem. In addition, when multiple shapes combined, the overlapping petals from each piece generated a three dimensional effect. Even though a bolero jacket was used, the Module Design I pieces could easily be transformed into a variety of looks, allowing for personalization.

For the dress, the pattern was first drafted on Optitex, including a half circle skirt with a sleeveless top which were then divided into panels. The prints were created from Adobe Illustrator and then digitally printed on linen fabric. For the print design, the interconnecting lines on the bottom of the dress, represent the roots of the hydrangea and the connection of the collaboration between the two designers. The line work of the hydrangeas were blended around the top of the skirt and the bodice of the dress. After the fabric was printed and cut out, Module Design II pieces were sewn on the edges of each linen piece. There were a total of ten panels on the skirt and four panels on the top. The dress was formed by the use of Module Design II pieces interlocking together. Therefore, the print design on the bodice and skirt panels of the dress are interchangeable to present different surface design, which can be rearranged to shown as all darker print, lighter print or alternating print on the front depending on the wearer.

The modular concept allows the designers and wearers to create endless sustainable possibilities for their designs. For the Module Design I, used on the bolero jacket, each piece can be combined together in various ways to create different garments and accessories. By joining with the linen fabric and the engineering print, the Module Design II idea increased the versatility and functionality of the dress. One challenge of using modular design to create wearable pieces is to select fabrics or materials that are durable and no-fray. With Module Design II, the pieces can be used on a variety of conventional fabrics to create wearable garments. There are also possibilities for Module Design I and Module Design II to be joined together. This design also aligns with the apparel designer's creative scholarship on transformable garments. Future studies will include the exploration of different designs for the module shapes and various materials for the modular design to increase wearability and versatility.

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