



Floral Fusion: Digitally printed and laser cut dress and bolero jacket.

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Keywords: Laser cutting, digital printing, design process

**Concept and context:** *Floral Fusion* represents a continued exploration of the creative possibilities for integration of a digital textile print with laser cutting. The designers previously experimented with use of laser cutting as a tool to create techniques for adjusting fit, and with internal laser-cut shapes as a beginning point for garment shape development (Parsons & Morris, 2017; XXXX, 2018). The goal of *Floral Fusion* was to use digital print design both as a guide to create textures within the garment and as a tool to create individual print motifs to be used as 3-dimensional shapes for applique. Others have used laser cutting to create allover patterns on solid cloth, to create lace-like patterns to overlay other fabrics, or to cut individual pieces from solid fabrics as applied surface design (Shin and Hwang, 2014, Hwang and Zhang, 2015). The untested intersection of digital printed design with laser cutting offers many dimensions for creative work, but also presents challenges for aligning the print with the cutting pattern. In addition, use of 100% silk for printing required supplemental layers of fabric and adhesive to prevent laser-cut edges from unraveling. A series of experiments was designed to test support materials for the printed cloth, to test techniques for aligning print and cut, and to design an aesthetically appealing garment that complimented the body through both laser cut and print.

**Process, techniques, and execution:** In this work, the textile print design led the decision-making for garment silhouette design. To begin, the first author created several original digital art compositions that combined photographs of dogwood flowers and various leaf forms. Internally drawn lines were added using drawing tools in Photoshop to enhance both color and form of the flowers. Two digital print compositions were created, one was designed with smaller motifs that filled the frame, while the other had motifs that began at one corner and flowed to the other, as if falling across a page. After the prints were created, garment design was based on both the print and the laser cutting goals. The co-designer's goals with laser cutting were three-fold: to engineer the laser cutting to follow the contours of the floral motifs along the garment edges, to laser cut interior lines along various motifs to enhance the texture of the cloth, and to laser cut individual full flowers and leaves for additional applied surface decoration that would create three-dimensionality. It was determined that a dress and bolero jacket allowed experimentation with each considered aspect of print and cut interaction.

Initial tests of fabric and backing materials included two different fusing webs and two different fabric backing materials. As the combination of fusible webs and backing can create fabric with a stiff drape, these choices were critical to final design outcome. Ultimately the printed fabric was bonded to a silk chiffon backing using a lightweight Pellon stretch fusible web intended for knits. Only the bolero jacket was fully backed and laser cut. The dress was not backed to retain the drape of the printed silk crepe. The bolero jacket textile design had an engineered print so that a row of flowers followed both hem and one sleeve edge. The process of creating a laser cutting template to follow the prescribed image outlines proved to be a challenge. The laser paths had to be determined after printing, rinsing and fusing to account for fabric shrinkage and skew from these processes. The authors used tracing paper to define the laser cutting path by pinning the paper to the finished fabric, tracing the cut lines with a pencil, and

tracing a square outline of the print composition (Figure 1). Next, the paper was scanned and opened in Adobe Illustrator where the pencil lines were traced to create vector paths for laser cutting. The laser cutter was registered to the outlined square and cut. Registration of the cutting paths proved difficult in the laser cutter bed and the initial cuts were offset from the intended paths. Therefore, the second author elected to cut the file from paper first and use the cut paper as a template to align the printed fabric. To do this, a large sheet of pattern paper was taped to the laser cutter bed and the cut file was run. Interior cuts were removed without moving the paper, and the printed fabric was slid and aligned with the cut paper. The cut was then run a second time. This process produced more reliable results, as the paper template was more consistent and made it possible to see the relationship of the print and the laser cut outline before cutting (Figure 2).



Figure 1. Pencil outlines of motifs on paper.



Figure 2. Sleeve edge in laser cutter over template

**Aesthetic properties, visual impact and cohesion:** The overall design aesthetic of *Floral Fusion* is intended to create a flow of movement first through transitions in print scale from smaller on top to large at the hem, and second through placement of the laser cut flowers individually on both the standing collar of the dress and on the upper right side of the jacket. The latter create an element of softness and accent the face. Because the print is curvilinear and was created to give the impression of water color techniques, there is an overall aesthetic of movement and grace on the body. The skirt is composed of two squares of the full print design composition, each one cut diagonally with the bias placed along the side of the body and straight grain at center front and back, creating additional contour and movement. The front skirt is draped from an inverted V at center front and stretched slightly to allow it to meet the back side-seam at an angle. This creates a void in the garment silhouette that produces an optical illusion of slenderness through the waist.

**Design contribution and innovation:** Fashion design is about materiality, and, with use and integration of digital technologies such as digital textile printing and laser cutting, it is possible to create new variations of textures and color, and to manipulate the forms on the body. When new creative approaches are envisioned for these tools, it is essential to develop and test an approach so that can be communicated to and built upon by others.

Date Completed: May 25, 2019

Materials: Silk crepe, Silk lining, Pellon fusible web

Measurements: Female mannequin size medium (chest: 34"; waist: 27"; hip: 37")

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