Engineered Embroidery

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The use of new technology forces designers to expand their understanding of the design process and alter their methods of the design process and alter their methods for designing, thus potentially generating new products. In a rapidly changing technological environment, the possibilities for new approaches to the design process, charges in production methods and changes in product types need to be addressed by both design researches and practicing designers. (Parsons & Campbell, 2004). Therefore, the purpose of this design was investigate the capabilities of the Melco Amaya XTS embroidery machine with the intent to create a fully-fashioned embroidered garment that incorporates an engineered surface design. Multiple sources of design tools and software's were used to complete the experimental design and develop complex embroidery patterns. The stages from design to production were as follows: Design inspiration and pattern development with Adobe CS6 software, digitizing and manipulating patterns in Optitex PDS, textile design development and placement, converting engineered textile design to digitized embroidery design with Design Shop Pro, stitching and abutting pattern pieces with Melco Amaya XTS, and post treatment of the embroidered garment.

Figure 1. Front View

The Melco Amaya XTS embroidery machine allows a designer to create various textures and colors with the types of stitches and patterns of stitches, therefore the aim was to emphasize multiple textures and colors in the design. The final design is a loose fitting top with geometric color and texture blocking. Pattern pieces were developed to be small enough so they would accurately fit in the 11"x17" embroidery hoop. A simple A-line silhouette was selected because of the complexity and unknown nature of the experiment. The pattern was manually draped with muslin on a size 12 Wolf form. Pattern pieces were cut and placed on the Optitex PDS Digitizing table where they were digitized and virtually placed in the Optitex PDS 11 software.

Figure 2. Back Details

Once in Optitex software, pattern pieces were trued to ensure each corresponding seam was the same length and they lined up accordingly when stitched together. Pattern pieces were exported as an Adobe Illustrator CS6 file to start development of geometric surface design. Once opened in Adobe Illustrator CS6 the image was reduced to half scale for ease of use in the program and each piece was saved individually. Once saved in Adobe Illustrator CS6 the patterns were opened with Adobe Photoshop and then virtually abutted together to portray one side of the front of the garment. The surface design was developed in a new layer over the pattern pieces allowing for a visual reference of how the surface design was going to line up at each seam. Once the images were finalized on each pattern piece the digitizing of each piece to an embroidered pattern piece in Design Shop Pro occurred.

The colored geometric shapes of the surface design were outlined with the "Complex Fill" tool. Each shape was given a designated color as well as textural design. Daukantien and Laurinaviviute (2012) state that there were a few variables that might affect the quality of the embroidered garment and they include stitch density, backing materials, bulging/puckering, and poor finishing techniques. These variables were considered and therefore overlapping occurred on all edges about 1/8" to ensure no gapping between color-blocking shapes. Pattern pieces were stitched on SOLVY, a water-soluble fabric, so the end garment was purely embroidered stitches. A "fill" stitch was chosen so the end garment provided additional coverage. The stitch density was placed at 6.0 to ensure accurate coverage, and due to the delicateness of the SOLVY, four piles of the material were used to prevent tearing during the embroidery process.

Each piece was then seamed together using the Melco Amaya XTS embroidery machine and a column of fill stitches and corresponding colors of each connecting piece. Adjustments were made when angles of each pattern pieces weren't in line. Once all pattern pieces were stitched together the garment was soaked in water for 10-15 minutes to dissolve the SOLVY fabric, and then air dried overnight. The finished garment was much softer than anticipated and became more flexible and fabric-like when the SOLVY was dissolved. Edges were finished with a black lining and separating zipper sewn into the center back.

References

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