

Exoskeleton

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Contextual Review and Concept

The process of integrating the skills and expertise of various designers in one common project has been referred to as “the capitalization of collective design intelligence” (Frascara, 2008, p.10). Cobb et al. (2014) found an increased opportunity for innovation through this type of creative design collaboration. However, collaboration between craft makers is often difficult due to irreconcilable cultural and methodological differences (Yair et al., 1999).

This design submission is the collaborative artifact created by three fashion design instructors and practitioners that aimed to combine their design skills via social interactive practice. A Japanese story, that of princess *Takiyasha the Witch and the Skeleton Spectre*, painted on woodblock by Kuniyoshi, U. (c. 1843 - 1847), captured the imagination of the designers. In the painting, the princess summons a giant skeleton to help her revenge her father’s death. Words derived from the story, such as ‘mystery,’ ‘power,’ ‘presence,’ and ‘deep black,’ were translated into materials and construction techniques after a two-month conceptual development process (Gorea et al., 2018). The result is a high fashion look with an intriguing mix of crafted details that highlights each designer’s expertise, as well as a material reflection of the rich creative experience and innovative employment of techniques inspired by ethnic storytelling.

Process and Techniques

As long-term practitioners in fashion industry, the design team has a vast range of skills, and knowing who does what the best was an initial step in the conceptual development process. One member is a passionate collector of Arts and Crafts period pieces, and his collection influences his practice as a metalsmith. Another member has knitting expertise, with focus on sports bras and activewear design. The third member of the team is the curator of a vast historic costume collection, with extensive patternmaking and draping practice too.

The team narrowed down the details to be used at various stages of the design process, both in conceptual as well as visual ways (Ellington, 2014). Specifically, the gigantic white skeleton from the story reflects Princess Takiyasha’s newfound magical abilities given by a mountain hermit, and it was this element that was decided right away to be made in metal and serve as the focal point of the entire look. Enlarged anatomical images of a human back spine were stylized and traced via Adobe Illustrator into flat shapes that were furthermore cut out in paper and draped on the center back of a dress form. To give weight balance to the garment and a

contemporary look, a metal shape was included in the front of the garment too, tracing the seams of the bra cups. Besides empowering meanings, the metal bra shape is a protective and functional, yet feminine detail. Textural interest was added to the sterling silver shapes by *reticulation*, a metal technique that creates an organic surface by repeatedly heating, cooling and cleaning the silver, resulting in texturally raising to the surface of the pure silver from the sterling alloy.

To complement the engineered, tailored look of the metalwork, a cropped jacket with voluminous kimono sleeves was designed to support the metal weight, while also reflecting the aesthetic yet functional needs of a feminine warrior. The fabric for the jacket is a black *gros de Londres* that was brought from Paris by a team member, a lightweight shiny silk weave with ribs alternating between wide and narrow with different textures of the yarn, a perfect combination of masculine stripes for a feminine silhouette. The limitation of having only 1 ½ yards of fabric led to a draping experimentation. An old pattern inspired the sleeves of this piece, with soft kimono shoulders and several deep elbow sleeve pleats. Center back radiating darts are shaping the jacket under the metalwork, creating space for the tri-dimensional metal pieces, and creating a gap aimed at protecting the spine cavity and comfort of the wearer. Moreover, structured and padded bra cups with quilting stitches were integrated into the front of the jacket, a construction challenge that required many muslin try-outs to perfect the pattern and fit. A softer black silk satin was used for the quilting parts. The shaped standing collar also has quilted stripes for added stiffness and a gracious outline.

For the under-jacket piece, an athletic bodysuit was considered current and appropriate for the concept. Lindqvist's (2015) kinetic garment construction theory was a starting point for draping the pants, using a black medium weight knit fabric, with a surface texture reminiscent of the reticulated metal. The inseams wrap around the legs, intersecting two more seams at the crotch area that provide extra leg mobility. The pants extend into a circular hand knitted halter-top, with engineered stitches and yarn combinations reminiscent of a sports bra. A lace-weight cashmere black yarn was used in varying plies to smooth out the transition between the fabric of the pants and the sheer top area of the bodysuit. Moreover, selectively steaming the transition area, allowed for the felting of the fibers and a seamless look, while the added Lycra® yarn shrank and gathered the back waist. Added red metallic thread integrates the heavy metal work of the jacket with the flowing red blood details from the story. The entire bodysuit hangs from the neck via a slim but strong copper wire necklace.

The giant skeleton from the story gains his powers from eating people, and his blood thirstiness inspired the selection of the lining of the jacket, the color of the satin piping, the red glass piece at the back, and the intentional see-through serging thread color of the seams of the pants. The pattern of the jacket lining, a small rose warp printed silk chiné, is an 18th century warp print design that was favored by Madame de Pompadour (Fukai, 2002), and was carefully selected as a metaphor for the lost souls ravaged by the giant skeleton. The entire look has a

wearable feel, strikingly slim and elegant, while as edgy and modern as the fashions of Alexander McQueen.

Design Contribution and Innovation

Craft making requires social engagement and knowledge- sharing, producing authenticity imbedded with cultural references (Hur & Beverley, 2013). This project resulted in a cohesive and innovative employment of techniques, up-skilling each team member, and confirming the importance of collaborative design as a creative platform that leads to original artifacts (Cobb et al., 2014). This study also confirms the importance of ethnic storytelling, which many other scholars found that inspires the development of innovative design techniques (Ellington, 2014). Moreover, started as a conceptual experimentation, the *Exoskeleton* high fashion look can be adapted for limited production, by using current technologies: 3D printing for the metalwork part, digital printing for fabric print, and knitting technologies for the bodysuit.

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