

Design for a Wasp-Loving Entomologist. Using Digital Printing and Creative Pattern Cutting to Create an Ensemble to Reflect One's Research Interests

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**Contextual Review and Concept.** The purpose of this ensemble was to celebrate the beautiful home and industrious nature of *Dolichovespula maculata*, a type of wasp colloquially known as the baldfaced hornet. (Figure 1). The ensemble was designed for a university professor who studies this wasp to wear to an entomology conference. Entomology academics commonly enjoy wearing apparel and accessories made of materials from or referencing the insects they study to academic conferences (See social media hashtag #entofashion.).

The *Dolichovespula maculata* wasp is a black with white markings (Akre, Greene, MacDonald, Landholt, and Davis, 1981) (Figure 1). In the spring, queens build large, pear-shaped nests (up to 23 inches in length) by collecting and chewing cellulose from weathered and rotting wood. Mixed with her saliva, a paste is formed that creates a papery material. The mix of materials used creates a beautiful texture, combining hues of gray, white, and brown. (Jacobs, 2015). The nests start with a central honeycomb structure, then are covered in layer upon layer of wasp-made paper. It is possible to deconstruct the abandoned nests and retrieve the individual pieces of wasp paper for decorative use. Previous research indicated that using the nest paper pieces directly in garments, while beautiful, did not lead to garments that could withstand everyday use (McKinney, 2016a). Subtraction cutting techniques (Roberts, 2013) can be used to create unusual shapes and volume, which would be useful for representing the nest shape. Subtraction cut garments typically use six or more yards of fabric. McKinney (2016b) documented a process for creating digitally printed garments directly from half-scale patterns, thus using 25% less fabric in the sample-making stage. However, this process had not previously been used with subtraction cut garments. The design challenge was to represent the hornet and its nest as much as possible in the ensemble's shape, color, and trims. Construction challenges were not being able to use actual wasp paper pieces in the garment and combining half-scale subtraction cutting with full-scale digital printing.



Figure 1

**Aesthetic Properties and Visual Impact.** Digital printing was selected as a way to incorporate the beautiful texture of the nest and the image of the wasp into a wearable and washable garment. Two coordinated prints, related to the wasp and the nest, were created. The gray, white, and tan colors of the nest were darkened to harmonize in color with the dark color of the wasp. Subtraction cutting techniques (Roberts, 2013) were used to create a voluminous and complex dress silhouette, mirroring the shape and multi-layer structure of the nest.

**Process, Technique, and Execution.** To create the wasp nest digital print, a nest owned by the university professor was carefully peeled apart layer by layer. Individual pieces were



Figure 2

photographed and collaged in Adobe Photoshop. To create the wasp print, an image of the baldfaced hornet resting on a stem of flowers was placed in a hexagonal repeat print design. The hexagonal shape resembles the cells of the honeycomb inside the nest. The dress patterns were developed in half-scale using the subtraction cutting technique (Roberts, 2013). A first sample was also created in half scale to check if the patterns achieved the desired silhouette. The pattern was digitized into Optitex 15 PDS and imported into Adobe Illustrator where the holes were trued and prints were applied by using clipping masking (Figure 2). The wasp print was placed at the top on the front of the garment, drawing attention to the wearer's face, as well as filled the top half of the back. The remaining skirt portions were filled with the wasp nest print. The file was exported to Wasatch RIP software and made full-scale. The 100% cotton fabric (8 yards) was digitally printed using reactive inks on a Mimaki TX2-1600 textile printer, and steamed. The digitally printed fabric was cut, sewn, and pressed. The subtraction cutting resulted in an uneven hem line. The hem level was marked on the wearer. Excess fabric was cut off and hand-made into bias-cut binding. A dark brown 100% silk turtle-neck was upcycled into a cardigan to complete the ensemble and provide an option for regulating thermal comfort in indoor and outdoor conference environments. The dress neck, armhole, hem and cardigan center front edges were finished with the matching bias binding, which created neat finishes on those curved edges. A large wooden button was selected as a closure as a reference to the wood the wasp chews to generate the paper for its nest.

**Cohesion.** Cohesion was achieved by uniting the purpose of the garment—i.e., celebrating the wasp nest's natural beauty—with surface design, pattern making, and trim choices that added to the aesthetic impact of the ensemble.

**Design Contribution and Innovation.** The digital printing and subtraction cutting techniques worked together to accomplish the goal of creating a special ensemble for an entomologist to better reflect her research interests in her social surroundings. She is pictured below with two of her favorite things—a wasp nest and her insect net. The volume and layers of completed garment reference the many layers of a *Dolichovespula maculata* wasp nest, while the developed prints reference the nest and wasp and establish a cohesive color story. The ensemble received much interest when it was worn at the entomology conference. This complex work extends the knowledge of developing digitally printed garments directly from half-scale patterns (McKinney, 2016a) to subtraction cutting. Although this particular ensemble was designed for one person, the customization approach taken can be used for a variety of individuals and interests.

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