Wearable Art Inspired by an Ecosystem's Life Cycle: Decay

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Nature has long been a foundation for human creativity, offering enduring inspiration across disciplines. The design approach known as biomimicry—coined by Janine Benyus—encourages designers to learn from and emulate natural forms, functions, and systems as models for sustainable and innovative solutions (Dicks, 2017). Applications of biomimicry span multiple industries, including architecture, engineering, interior design, technology, and medicine. When nature serves as inspiration for wearable art pieces, designers can experiment with innovative techniques and push the boundaries of garment construction to replicate a natural model's appearance, function, or symbolism. In fashion, designers can experiment with different techniques to mimic or reflect the aesthetics and behaviors of natural organisms. When translated into wearable art, this philosophy fosters expressive garments that integrate visual symbolism and functional innovation.

Simplified representations of organic forms, such as colors, patterns, and textures, are known to reduce stress and appeal to innate human preferences for natural environments (Gerola et al., 2023; Yoo et al., 2020). Ecosystems, as complex yet cohesive networks of living and non-living components, serve as conceptual frameworks for biomimetic design (Willis, 1997). While individual organisms, inorganic elements, and environmental factors vary between ecosystems, each ecological network functions similarly as all components within the system directly interconnect and work together to survive. Yet an inevitable step in each ecosystem's lifecycle is the decay and death of the unit, as "no system is expected to have an infinite life span" (Costanza & Mageau, 1999). However, where there was once decay, new growth can occur, and a system can start anew (Costanza & Mageau, 1999).

The design inspiration of this collection was drawn from both the visible and invisible elements of nature. This particular submission is the third and final stage of an ecosystem's life cycle, Decay. It marks the end of one system as plants wither and die, and fauna perish or migrate to neighboring ecosystems. Although this stage marks the end of the lifecycle, it plays a crucial role in setting the stage for a new ecosystem to take root and for the cycle to begin anew. *Lycoperdon Pyriforme*, mushrooms, and decaying trees were used as inspirations for textile manipulation designs and colors. The ensemble features a dress with a curving drop waist and winding style lines and an open-sided skirt to accommodate various bottom options. A half-skirt with garment panels is worn underneath the gown to provide three-length options for the wearer. These overlapping layers appear to decay as they approach the ground due to the

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increasingly condensed shibori detail, and modular links can be looped to various connection points between the layers of the skirts, simulating a layered plant with petals or leaves growing on its surface. Different Shibori techniques were tested before the selection of boiled shibori with bound marbles and beads and pleated heat set. The textures of the bulbous shapes reflect those of rounded fungi, and the pleated sections mimic a bed of moss or a decaying stump where fungi and other fauna may emerge. Each tier of the Shibori skirt has a gradual gradient, with each layer varying in shade and saturation. The lower tiers become muddier, with brown undertones, as splotches of burnt orange change to further emulate a decaying ecosystem.

Modularity is the ability to assemble connecting pieces in various combinations to create unique, custom pairings that can be altered based on the wearer's preferences. Like an evolving, growing ecosystem, customizable elements on a garment are adaptable and can provide endless configurations when applied to a garment. The individual modules come in various shapes and sizes; yet, Mansour (2017) labels them into two categories: garment panels and "Lego-like systems." Panels are exactly what they sound like; generally, large pieces of the garment that can be added, removed, or replaced. These garment panels enable customization of the garment's body and offer additional ways to wear a single garment or adapt it based on the season and occasion (Hur & Thomas, 2011). In contrast, Lego-like pieces, or in the context of this research, modular links, are individual pieces that can interconnect to create a garment or add interest to a base garment. These links are often duplicates of each other, but variations in size, shape, and color could be used in combination, as long as connection mechanisms remain universal (Mansour, 2017). For this look, fabric modular links were conceptualized to create looping, petal-like forms interconnecting in vertical rows. The link shape resembles a double-ended spoon with rounded ends connected by a middle stem and a slit on one side. Garment panels are used to split the skirt into three length options as shown in Figures 1-3.

Figure 1. Full Length

Figure 2. Without the bottom layer.

Figure 3. Only top layers

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3D modeling software was used to design root-like pieces and 3D printed. Printed out of white thermoplastic polyurethane (TPU) for flexibility, the roots were trimmed, dyed brown, and brushed with two shades of gold gilding wax, which was sealed with Mod Podge. The colors of the roots mimic the gold from gold ore, which symbolizes wealth and elegance. These roots were hand-sewn using transparent thread along the style lines of the garment, and a wire was used underneath the vine neck piece to hold its shape.

This look features a dress with a curving drop waist, winding style lines, and an open-sided skirt to allow for various bottom options. A half-skirt with garment panels is worn underneath the gown to provide three-length options for the wearer. These overlapping layers seem to decay as they near the ground due to the increasingly condensed shibori detail, and modular links can be looped to various connection points between the layers of the skirts, simulating a layered plant with petals or leaves growing on the surface. This look was created using a draping technique on a U.S. size 8 dress form. All pattern pieces were sewn with ½ inch seam allowances. This look is a “weak” or abstract biomimetic design, as the colorations, textures, and customizable elements are not accurate replicas of natural elements, but rather stylistic interpretations of natural colors, forms, and textures, and the decay of an ecosystem.

This study serves as a starting point for future biomimetic wearable art as it shows one designer’s perspective on interconnecting ecosystems and the organisms living within them. Nature is a vast, unlimited source of inspiration, which designers and creatives can continue to draw from as they have for thousands of years. This is just the starting point for what is achievable when design, nature, technology, art, and modular systems are morphed into one.

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