

## **Neo-Cultural Artifacts for Eco-Fashion Semantics: No Being Without the Sun**

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### **Abstract**

**Research issue:** The aim of this case study is an exploration into how garments can help us connect to our planetary environment: creating fashion that is both expressive and environmentally friendly. With garments, we tell stories about who we are and who we want to be. Clothing was originally intended to protect us from the elements and enhance our appearance. Over time, fashion has evolved into a way of expressing ourselves and entering a multi-faceted relationship between our body and the space around us within societal, psychological, and political contexts. (Leutner, 2012; Gaugele, 2016). The price of this expression however is high: the fast-paced fashion industry has major critical environmental implications (Niinimäki et al., 2020). How can we create a garment that combines expressing ourselves, while actively and consciously engaging with nature? This research explores the close connection between our body and identity, sustainable energy, and material culture, through the example of a working prototype of fashion technology interacting with solar energy.

**Methodology:** The aim of this design project is to use the sun, the source of planetary life, as a sustainable resource of energy, binding the reason for existence to personal identity. Following a “Research through Design” approach (Zimmermann et al., 2007) the topic was explored by researching, sketching, experimentally prototyping (Dalsgaard, 2010), and evaluating the interactive concept in an iterative methodology. Experimental prototyping approaches were used in a divergent and convergent framework – from ideation to fixation. Project-based design research covers work in adjacent fields and is contextualized by recent work taking on similar challenges, as well as materials investigation and the inclusion and use of suitable hardware components, as well as aesthetic and cultural context, classification and evaluation. Accompanying materials research, an ongoing, four-month practical design research resulted in a prototype artifact. A kimono-shaped black cloak, tailored from 100% water- and energy sustainably sourced viscose, was designed and constructed to function as a puristic, neutral-acting medium to leave room for the intended communication and expression of the wearer. Integrated flexible solar panels, stylistically placed holding the area of shoulder pads, harvest the solar energy, thus furnishing power for a glowing row of symbols. The language symbols are embedded in the garment through a vertically attached, magnetic strip, worn over the spine, and controllable by the wearer. The garment thus features a speculation on language's nature and the spectrum of meaning, and how it symbolizes and controls fluid identity and thereby individualized

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personalization. The embedded lettering, which resembles Morse code characters, is based on a speculative sign system created prior to this project for taking quick notes. It semantically explores an artistic expression of information transformation and consists of fictional symbols. According to the wearer's preference, the luminous glowing symbols can be controlled with a magnetic switch on the collar. This laser-cut, LED-underlaid main part was magnetically applied to the cloak over the spine, electronic hardware parts were insulated, washable hardware components subtly integrated, and interwoven into the fabric. The final touch of crafting the contrasting materials together into a hybrid object was vital for forming an artifact that symbolizes both a closeness between body, natural energy, and language, as well as an intimate personalization resulting from this connection. In current and ongoing research, biodegradable PLA wire coating and washable hardware components allow for prototyping a ready-to-wear piece with responsible use of production materials. The design artifact constitutes a neo-cultural frame, presenting the steady exchange between body and environment in harvesting energy from the sun to fuel the individual freedom of personalized identity expression. The interactive garment symbolizes, as a "thread of life", the direct link between individual existence and the sun.

**Results:** This wearable artifact and illustrated concept sheds light on the ancestral connection between body and environment which, in the current crisis, is disturbed. In the context of eco-fashion approaches (Niinimäki, 2010), this prototype extends the aspects of wearer's personal expression with their reconnection to the environment. Planned further observation and comparative contextualization are needed to identify the, for the wearer, altered impact and perception (Johnson et al., 2014) in times of digital fashion. (Mackey et al., 2017). The resulting artifact and underlying technologies present the potential to engage personal expression by raising awareness for a personalized reconnection with the surrounding environment.

**Keywords:** fashion technology, wearable technology, eco-fashion, sustainability, research through design.

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