

Using Data as a Material to Make a Knitted Garment

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Textiles have been created using a combination of materials and data for thousands of years. The worn and tangible experience of textiles often places more importance on the data that creates the structures of the textile than the material itself. In previous work such as “Data as a Material for Fashion” [1] I discuss how this provocation stand to turn fashion into something else, yet at the same time is something that humans have created for thousands of years. But what does it mean to make textiles and fashion with data as a material with the emerging technology of our time? In this pictorial we briefly describe making a sweater from data for Prof. Loe Feijs for his validictory seminar using one of his algorithms. Textiles offer a rich and complex materiality that presents unique opportunities and challenges for designers seeking to create objects that incorporate data as a material.

Making a Sweater with Data

Feijs and Toeters [2] have described using cellular automata to generate a classic fashion pattern known as Houndstooth or Pied di Poole in woven textile. We took this data and translated it to knitwear to understand the data in a different textile format. This required reinterpreting the data generated by the algorithm, see fig 1, so that it could be expressed as a knit. This was a challenging process as the level of detail required is difficult for the Shima Seiki Mach 2XS Knitting Robot, see fig 3. We started with a sweater that had little data in it and then blended the data in, fig 4, which required several versions, see fig 5, to eventually realize the detail found in fig. 2.

There is an interesting post-phenomenological experience that happens when wearing the sweater if we consider the data that is being added to be blended with the wool material being used. The data is more important than the wool on a visual, and tangible level, which can be seen in fig. 6. This becomes even more true when the garment is worn on the body and a more what Peter-Paul Verbeek might call a “cybernetic intentionality” [3] emerges.

This leads to the question of whether sweaters can be made of data rich textiles that are not only created by encoding with data but also change while being worn? It is possible to imagine a scenario where the textile of a shoe changes its shape and form based on the wearer’s movements and the data collected by sensors in the shoe. This data could then be read back into a computational system to create a feedback loop, allowing the shoe’s textile to adapt and change over time based on the wearer’s needs and preferences.

Moreover, what happens when the high-resolution cameras that are on our streets and in our shopping malls can read that material data and use it to design new things for us or identify us by our wardrobe instead

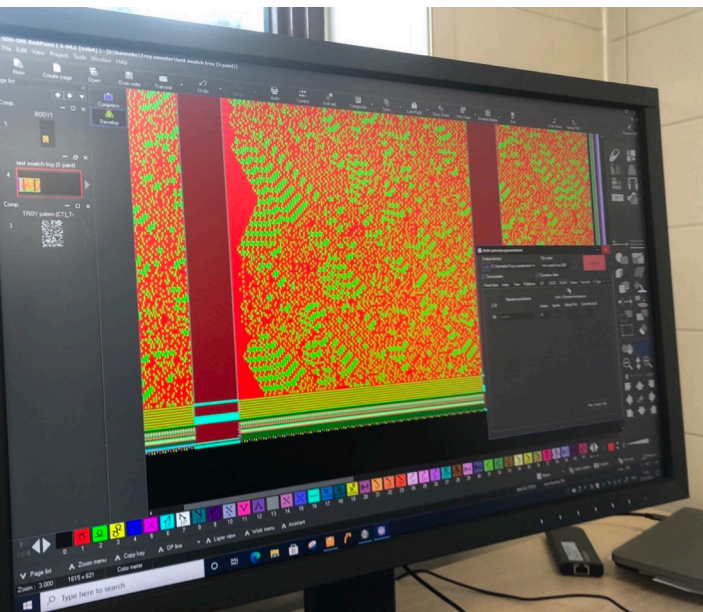


Figure 1. Bringing the Data from Loe Feijs into the sweater using APEX 4



Figure 2. The finished Wool/Data Sweater



Figure 3. Knitting the sweater on our Shima Seiki Mach 2XS knitting robot.

Figure 6. The data is a more important material than the wool on an experiential level.

of facial recognition. Previously it was imagined that data would be physicalized [4] and that pockets would become a form of securing the data. What is it when we need a form of purda to protech our identity not only as facial recognition, but wardrobe recognition.

How this has been received in the past?

If we consider the sorted history of fashion this is going to be an intersting moment. The religious order of Luddites were organized around the profession of textile weaving. As Jaquard invented early computer procesing[5], so that looms could incorporate complex data as a material into textiles Ludd became famous for destroying textile machnery that took work away from the textle guilds. Wih the formalization of the jaquard computation machine in 1804 the Luddites With companies like byBorre (<https://www.instagram.com/p/CpDKmPUKiGI/>) converting their fashion practice into software platforms to democratize data as a textile mateiral for all we can imagine a similar backlash.

And the future?

As AI and Visual recognition technologies become better and better, I can imagine complex feedback loops that leed to increasingly personalized fashoin that communicates complex information about the wearaer yet requires little to no electoronic technology worn on the body [6].



REFERENCES

- [1] Loe Feijs and Marina Toeters. 2018. Cellular Automata-Based Generative Design of Pied-de-poule Patterns using Emergent Behavior: International Journal of Design 12, 3: 127–144.
- [2] Rachel Keranen. 2016. Inventions in Computing: Cavendish Square Publishing.
- [3] Troy Nachtigall. 2021. Data as a material for fashion. Hogeschool van Amsterdam.
- [4] Troy Robert Nachtigall and Kristina Andersen. 2018. Making Secret Pockets. Extended Abstracts - CHI '18, 1–6.
- [5] Troy Robert Nachtigall, Oscar Tomico, Ron Wakkary, and Pauline van Dongen. 2019. Encoding Materials and Data for Iterative Personalization. s – CHI '19.
- [6] Peter-Paul Verbeek. 2008. Cyborg intentionality, Phenomenology and the Cognitive Sciences 7, 3: 387–395



Figure 4. (Left) Complex Data as a material (Top) Simple (bottom) and the conflict between the two (middle).

Figure 5 (Right) Prototyping the expeience of wearing the data/wool sweater by author and co- maker.