

Jun 25th, 9:00 AM

Designing with Bodily Materials

Marie Louise Juul Søndergaard
The Oslo School of Architecture and Design

Madeline Balaam
KTH Royal Institute of Technology

Follow this and additional works at: <https://dl.designresearchsociety.org/drs-conference-papers>



Part of the [Art and Design Commons](#)

Citation

Juul Søndergaard, M.L., and Balaam, M. (2022) Designing with Bodily Materials, in Lockton, D., Lenzi, S., Hekkert, P., Oak, A., Sádaba, J., Lloyd, P. (eds.), *DRS2022: Bilbao*, 25 June - 3 July, Bilbao, Spain.
<https://doi.org/10.21606/drs.2022.1053>

This Miscellaneous is brought to you for free and open access by the DRS Conference Proceedings at DRS Digital Library. It has been accepted for inclusion in DRS Biennial Conference Series by an authorized administrator of DRS Digital Library. For more information, please contact dl@designresearchsociety.org.

Editorial: Designing with Bodily Materials

Marie Louise Juul Søndergaard^{a*}, Madeline Balaam^b

^aThe Oslo School of Architecture and Design, Norway

^bKTH Royal Institute of Technology, Sweden

*Corresponding author e-mail: mljuul@aho.no

doi.org/10.21606/drs.2022.1053

1. Introduction

We were motivated to create a track on the conceptual, practical and experiential qualities of ‘Designing with Bodily Materials’ based on our experience over the last decade in designing interactive systems in relation to menstruation, breastfeeding, menopause and awareness of the intimate body. In much of this work, we noticed how so many of the interactions (we)re made that related to the body avoided touch of the body, and first-hand interactions with many of the body’s materials. We found ourselves wondering what would happen if we developed materials, practices, and sensing and actuating technologies that were able to engage with our bodily materials, such as our menstrual blood, our hair, our body fat, our cervical fluids, our skin, nails and mucus? What are the new design opportunities that would emerge, which new experiences would dominate, and how might these affect how people understand and relate to themselves, their bodies, and the world around them? These questions are timely, and warrant our attention especially as products are emerging onto the market which promise to analyse menstrual blood to diagnose health conditions (e.g. <http://www.looncup.com>); that enable people to play games through squeezing pelvic floor muscles (e.g. <https://www.elvie.com/en-us/shop/elvie-trainer>); through to consumer-led devices focused on measuring the mobility of sperm (e.g. <https://yospermtest.com>).

Material driven design has gained momentum within design and Human-Computer-Interaction (HCI) drawing into focus how the material properties of the things we interact with influence the user experience (Fernaes & Sundström, 2012). Several methodologies support working with these material dimensions as part of a design process (Karana et al., 2015; Wiberg, 2014). An exciting progression within this work has been a focus on biodesign and biomaterials within HCI. Here, the field is beginning to see research that has incorporated and collaborated with materials and living species such as bacteria (Kuznetsov et al., 2018), fungi (Liu et al., 2018) and compost (Bell et al., 2022). This richness of work has resulted in the de-



velopment of practical and ethical principles for building research infrastructures and practices around bio-design (Kuznetsov et al., 2018), alongside a development in design frameworks that provide guidance and structure to research investigations within this space (Karana et al., 2020). Very recent work within the community is beginning to bring the intimate material body into interaction design, including the design of analogue design probes to speculate on the role of touch of the intimate body as a route to knowledge and empathy (Campo Woytuk et al., 2020), through to devices that enable a couple to analyse a saliva sample for signs of 'ferning' and thus fertility (Homewood et al., 2020), and design explorations of protein in human breastmilk (Helms, 2021) and bacteria in vagina microflora (Tomassello & Almeida, 2021). What is clear from this early work is that working with body materials challenges and extends the methods, guidance, and framings of material driven design. For example, body materials may be scarce or only available for research according to certain rhythms which creates ethical and speculative tensions in their use as a research material (Helms et al., 2021); body materials can be associated with stigma and taboo which put pressure both on the techniques used to involve people in a design process, and the designs of the resulting interactions (Campo Woytuk et al., 2020); and body materials can be associated with disease thus requiring new interdisciplinary knowledge regarding sample taking, storing and handling within the design process. We hoped when proposing this theme-track that we would be able to explore some of these emerging issues and we were not disappointed.

With this DRS theme-track we aimed to create a space where researchers and designers curious about these topics and practices could share experiences, expertise, best practices, failures, and nascent results to help nurture a community around these new materials for design and exploration. The resulting track is made up of four papers which explore alternative dimensions of designing with body materials.

2. Theme-track Papers

In Saúl Baeza Argüello et al.'s 'Designing Hair' the track presents design research which examines and speculates on the design opportunities that exist in relation to human hair. They argue that hair is a site for gender, cultural, and religious expression, tied intimately to notions of beauty, health and age. What is special about this paper is the combination of speculations on how we might design with hair in ways which break norms and provide new opportunities for self expression, while also sharing practical techniques for how to collect, create and design with hair. In this sense, 'Designing Hair' shares some of the traditions of material-driven design through presenting an understanding of the technical and experiential characterisation of human hair, and speculating on how hair can create experiences and products. Our interest is in part in the challenges that body materials bring when converged with design practice - and in Saúl Baeza Argüello et al.'s 'Designing Hair' we see how the designers grappled with notions of ethics, scarcity and personhood as part of their material explorations. Despite the labour and time involved in working with the researchers' and their networks' recollected hair, the designers choose to do this in order to avoid the tensions

that come from working with 'bought' hair, where it is difficult to know from whom this hair comes, and whether they received a fair price for their hair, and indeed whether they had the choice to sell their hair, or not. An interesting side-effect of this choice, the authors note, is that the act of collecting what would have been previously discarded hair changed their own, and their networks, relation to this body material. Paulina Yurman continues this conversation in her article 'More-than-Human Fluid Speculations' by experimenting with using body materials within a drawing practice. In this article Paulina Yurman provides a brief history of body materials as a tradition within art and design history and practices. She then conceptualises drawing as a designerly way of working things out, thinking things through, and experimentation in order to better understand an artifact, or a practice. By utilizing watercolor within this practice, Paulina Yurman is able to play with boundaries, push against the desire to quantify in order to reimagine and question how we live with technologies in relation to the body. In the drawings included in this paper, Paulina Yurman has chosen to work with (non-human) body materials in order to explore the speculative ideas that such a combination of materials produce and further discussion on what it might mean to design with body materials. In the illustrations that Paulina Yurman chose to publish she notes that she deliberately did not draw with her own body materials. She then wonders, if this was less honest than had she chosen to draw with her own materials, and whether this distance and separation for the body materials she was imagining drawing with changed the nature of the things imagined and drawn.

This critical choice faced and navigated by these two articles forces us to think about who gets to do design in relation to the body's materials and when encounters with body materials are part of design. Here, two different papers explore different approaches. In Saúl Baeza Argüello's work, the designer chooses to only work with materials that they themselves, and their friends and family produce. In contrast, Paulina Yurman works with found and bought materials, produced by other, non-human bodies. Not all bodies produce all body materials all of the time. This scarcity, this rhythm, confronts us with the perhaps obvious tension in designing with body materials - where do these materials come from? If we chose to use our own materials, we then become limited (perhaps) by what our bodies produce. Thus, working with others' body materials - perhaps even non-human body materials - creates the opportunity to explore, and do design work with materials that we ourselves do not have access to. However, when we work with other's materials, we have to ask ourselves where do these materials come from, how were they collected, and reflect on how this choice might alter the design process?

As discussed by Sasha de Koninck and Laura Devendorf in 'Objects of Care', working around notions of care, and especially care of bodies can be challenging for people because it often involves working with materials that people find disgusting:- tears, stains, smells and holes. At the same time, it is important to involve people in the design of potential new interactions with body materials because without this kind of work we risk producing tools and products that are stigmatising, undignified and frankly unwanted. Nevertheless, to involve people in design processes that relate to care of bodies, touch of bodies, and working with

notions of care and body materials requires thought and innovation on existing participatory and user-centred design practices. In 'Objects of Care' Sasha de Koninck and Laura Devendorf describe and share experiences with a card-based design method that they designed to support deep looking at objects in people's lives. The card-deck invites people to look closely at their objects' materiality (human and non-human) and notice how marks and signs of use also represent practices of care. Rather than framing these signs as problems to be solved, the card-deck prompts people to think of how the signs of care can be amplified or preserved; How stains on a dress can be transformed into decoration with the hair of a beloved cat, or how the care of a baby blanket licked by a mother's tongue can be commemorated by enhancing the softness of the textile. Although these workshops were not initially intended to deeply relate with body materials, the framing of care oriented the conversations and design ideas towards the body – imprints of the body, liquids from the body – often in interpersonal contexts, where caring is expressed through the links and relations between bodies and expressed through their bodily materiality. Designing with one's own or others' body materials can here be seen as a caring social act. One that is already part of people's creative practices and mundane everyday life.

Sasha de Koninck and Laura Devendorf's work prompts us to expand our understanding of bodily materials beyond materials of the body or materials that the body produces, to materials that the body has interacted with or intervened in. In their case, this includes textiles. As their work shows, in the meeting with the body, textiles are transformed and potentially also our attending to and care for the body, so a clear distinction between materials that the body produces and materials that are applied to the body, is perhaps less relevant or interesting for design. Textile asks where the leaky body ends and what leaks *onto* our body. In the paper 'Designing with Chemical Haptics', Jasmine Lu extends design explorations of the leakiness of the body towards what leaks *into* our body. Her work explores how chemical substances applied on the skin can disrupt and enhance our bodily senses, becoming a new chemosensory interface. Perhaps this work is not so much a design that works as an extension of the body, as typical prosthesis theorized through post-phenomenology and transhumanist philosophy, but a design that contests the bodily boundaries all together. To understand what this might mean for our design community and practically in design processes, it is crucial with new cases and exemplars. Jasmine Lu invites the reader into her design process of exploring off-the-shelf chemical substances and describes her subjective experiences of chemically-induced sensations on the skin. Ranging from hot, cold, tingling, numbing and stinging feelings, these sensations point to future potentials for bodily interactions and experiences in the entanglement of human body, machine and biochemical matter.

As these four papers clearly show, designing with body materials – from human and cat hair, to saliva, sweat, and skin sensations – raises questions of practical, ethical, philosophical and imaginative nature. What body materials are we (not) designing for? Who has access to them? Can we design with them in our current design workshops, or are new infrastructure needed? What are the ethical implications? How does designing with body materials change philosophical understandings of the human body? And what socio-material constructs of

'body' limit our imaginings of designing with body materials, and how can we expand them through our design practice? It is crucial for design to be part of the conversation and imaginings of how the body is entangled with products, systems and services. Such current and future realities cannot be left for medical or engineering disciplines, and design has a vital role to play in ensuring (more-than) human-centered equitable and sustainable ways of touching, experiencing and expressing body materials. The theme-track 'Designing with bodily materials' invites designers into close relation with the (non)human body's materiality. A materiality that may be messy, alienated, or uncomfortable, but as these papers also demonstrate, full of curiosity and care; an evocative space for design and a mundane part of everyday living. We invite the reader into a deep and embodied looking and reading through the papers in this DRS 2022 theme-track "Designing with Bodily Materials":

- **Saúl Baeza Argüello, Kristina Andersen, and Oscar Tomico.** "Designing Hair"
- **Paulina Yurman.** "More-than-Human Fluid Speculations"
- **Sasha de Konincka and Laura Devendorf.** "Objects of Care"
- **Jasmine Lu.** "Designing with Chemical Haptics"

5. References

- Bell, F., Ofer, N., & Alistar, M. (2022). ReClaym our Compost: Biodegradable Clay for Intimate Making. *Proceedings of CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, Article 454, 1–15. <https://doi.org/10.1145/3491102.3517711>
- Campo Woytuk, N., Søndergaard, M.L.J., Ciolfi Felice, M., & Balaam, M. (2020). Touching and Being in Touch with the Menstruating Body. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–14. <https://doi.org/10.1145/3313831.3376471>
- Fernaues, Y., & Sundström, P. (2012). The material move how materials matter in interaction design research. *Proceedings of DIS'12: Designing Interactive Systems Conference*, ACM Press, Newcastle Upon Tyne, United Kingdom, 486. <https://doi.org/10.1145/2317956.2318029>
- Helms, K. (2021). Entangled Reflections on Designing with Leaky Breastfeeding Bodies. *Proceedings of DIS'21: Designing Interactive Systems Conference 2021*. Association for Computing Machinery, New York, NY, USA, 1998–2012. <https://doi.org/10.1145/3461778.3462048>
- Helms, K., Søndergaard, M.L.J., & Campo Woytuk, N. (2021). Scaling Bodily Fluids for Utopian Fabulations. *Proceedings of Nordes 2021: Matters of Scale*, 15-18 August, Kolding, Denmark. <https://doi.org/10.21606/nordes.2021.23>
- Homewood, S., Boer, L., & Vallgård, A. (2020). Designers in White Coats: Deploying Ovum, a Fertility Tracking Device. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, ACM, Honolulu HI USA, 1–13. <https://doi.org/10.1145/3313831.3376528>
- Karana, E., Barati, B., Rognoli, V., & Zeeuw van der Laan, A. (2015). Material Driven Design (MDD): A Method to Design for Material Experiences. *International Journal of Design*, 9:2. <http://www.ijdesign.org/index.php/IJDesign/article/view/1965>

- Karana, E., Barati, B., & Giaccardi, E. (2020). Living Artefacts: Conceptualizing Livingness as a Material Quality in Everyday Artefacts. *International Journal of Design*. 14:3. <http://www.ijdesign.org/index.php/IJDesign/article/view/3957>
- Kuznetsov, S., Barrett, C., Fernando, P., & Fowler, K. (2018). Antibiotic-Responsive Bioart: Exploring DIYbio as a Design Studio Practice. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–14. <https://doi.org/10.1145/3173574.3174037>
- Liu, J., Byrne, D., & Devendorf, L. (2018). Design for Collaborative Survival: An Inquiry into Human-Fungi Relationships. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, ACM, Montreal QC Canada, 1–13. <https://doi.org/10.1145/3173574.3173614>
- Tomasello, G., & Almeida, T. (2020). Empowerment and Self-Care: Designing for the Female Body. in K Townsend, R Solomon & A Briggs-Goode (eds), *Crafting Anatomies: Archives, Dialogues, Fabrications.*, 9, Bloomsbury Academic, United Kingdom, pp. 171-188.
- Wiberg, M. (2014). Methodology for Materiality: Interaction Design Research through a Material Lens. *Personal and Ubiquitous Computing*. 18, 3 (March 2014), 625–636. <https://doi.org/10.1007/s00779-013-0686-7>

About the Authors:

Marie Louise Juul Søndergaard is Postdoctoral Researcher at The Oslo School of Architecture and Design. She explores speculative and feminist design of intimate health technologies, and has an interest in the materiality of the more-than-human body.

Madeline Balaam is Associate Professor in Interaction Design at KTH Royal Institute of Technology. She has spent 10 years designing intimate technologies. She is fascinated by ‘Intimate Touch’ and understanding how mediated touch might transform our understanding of ourselves.