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Valuing the qualitative in design and data

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Editorial: Valuing the qualitative in design and data

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Abstract: The DRS 2022 track ‘Valuing the Qualitative in Design and Data’ features eleven accepted papers on topics including visualisation and physicalisation of qualitative data, the use of materials in this context, practical applications in design and education, and applications in personal informatics. In this editorial, the track chairs introduce the track, and the reasoning behind it, together with a short introduction to the papers.

Keywords: qualitative data; visualisation; data physicalisation; materials; personal informatics

1. Introduction: Why ‘the qualitative’? ¹

This theme track takes a broad look at work which values ‘the qualitative’—and qualities themselves—in design research, including work specifically focused on displaying or interfacing with data. As track chairs, we were very aware of the (perhaps unwieldy) breadth of the scope for which we invited papers—but somehow nevertheless we were slightly underprepared for the fascinating range of topics for which we received submissions. The selection of papers which were accepted following the review process covers topics from participatory forms of data visualisation, to exploring the roles of materials and materiality,

¹ This section incorporates much of our original call for papers: <https://www.drs2022.org/theme-tracks/#01>



to questioning the notions of the self in personal informatics. Among the eleven accepted papers we have literature reviews, case studies of projects in both educational and real-world contexts, and theoretical perspectives; overall, we hope that the papers from this track provide a diverse-but-connected set of glimpses of an approach to design research, education, and practice which seeks to emphasise the importance of the qualitative in relation to the quantitative.

Why did we feel this particular framing was useful—or necessary? As nine researchers, working in different kinds of university (and outside of academia) in five countries, but with a general focus on interaction design (and related areas, often digital), we work every day within systems which prize quantitative data. Sensemaking, at an organisational level and within the kinds of outcomes we expect or are expected to deliver from projects, teaching, and so on, is largely predicated on *measurement*, which at least in most systems implies quantification.

But in the real world, it's often *qualities* which help us make sense of things. From a cat's purr, to wrinkled fingertips in the bath, the feel of fabric, the crunch of fallen leaves, or a map we draw for a friend, much of our experience is qualitative rather than quantitative. We live and feel in conversation with our perceptions of qualities of phenomena, people (including our own bodies), materials, and relationships between them. Telling someone you're 7/10 happy, or 62% in love, or even that you managed 10,000 steps today, is less meaningful than a richer description of your experience.²

Nevertheless, design so often—particularly in digital contexts—defaults to quantification (however creatively) as a mode for information visualisation, interaction with technology, and research around people's experiences, introducing extra layers of abstraction from the world. We believe that qualitative expressions of experience offer opportunities for new forms of understanding, types of relations, meaning-making, and (re)connections—with nature, with the systems around us, with ourselves, and with each other. Between us, in different ways, we find that we seek out (and indeed seek to do) work exploring the qualitative, indexical, poetic, analogue, indeterminate, interpretative, and perceptual, in design (including physical and digital 'materials'), data (loosely defined), and research with people (or nonhumans). Some of the indicative references provided in our call for papers, from our own (chairs') projects and others' work, capture these different approaches across many contexts, from C.H. Lee and Balint's (2021) work on 'qualitative contact' in space exploration, to Menheere et al's (2020) exploration of ways to motivate less sedentary workplace practices, right through to examination of traces (Robbins et al, 2016), wear (Devendorf, 2021), autographic visualisation (Offenhuber, 2020) and indexicality (Offenhuber and Telhan, 2015).

² Lockton, Ricketts, Chowdhury, and C.H. Lee (2017) attempted to create a taxonomy of more qualitative ways of translating real-world phenomena into displays and interfaces, which is critiqued and expanded by Lockton, Lallemand, and Menheere (2022) in their paper in this track.

Thus, for this track at the DRS conference, which in its community and audience encompasses a broad range of perspectives, from across the design research community (not just interaction design, but also design theory, materials, product design, and so on), we invited experiments, cases, reflections, and theoretical pieces, including (but not exclusively) approaches such as: drawing, patterns, materials and material expressions (traces, ageing, forms of repair), textiles, biodesign, soft robotics, kinaesthetics, somaesthetic design, models, metaphors, synaesthesia, data physicalisation, materialisation, sonification, autographic visualisations, analogue computing, tangible interaction design, ethnographic and inventive social science methods, ways of linking qualitative and quantitative, and the written word. (While the eleven papers here do not entirely cover this space, they certainly engage with much of it, in different ways. We leave the full list intact in this editorial to serve as a potentially useful marker in the literature for future explorers of this area.) Of course, we do not intend to exclude the numerical in any of this work, but would like to see it contextualised through qualities.

2. The papers

The papers' topics—perhaps appropriately—can be seen to lead us through a kind of story, from visualisation to physicalisation (Thudt et al, 2018; Offenhuber, 2020), to materials (Lean, 2020; 2021), to applications in design education and practice, and finally to personal informatics which is one of the major application areas in this field.

We start with Miriam Sturdee, Soren Knudsen, and Sheelagh Carpendale's 'Data-Painting: Expressive Free-Form Visualisation'. Sturdee et al (2022) expand the notion of expression in data visualization, moving it far beyond a 'mapping' stance through a method in which participants created paintings expressing a data set (about the 'appropriateness' of certain behaviours such as laughing or kissing in different social situations) in a variety of ways, with the 'quantitative' component being the volume of paint available for expressing the data points. The resulting data-paintings offer implications and insights around more expressive and non-traditional forms of engaging with data, "bridg[ing] a gap between expression, artistic practice, and data visualisation, with the aim to provide a process for exploring data understanding" (p.13).³

The expression of emotional or experiential meanings for particular data is also central, in a much more personal way, to Tommaso Elli, Adam Bradley, Uta Hinrichs, and Christopher Collins' paper 'Visualizing Stories of Sexual Harassment in the Academy: Community Empowerment through Qualitative Data' (Elli et al, 2022). Here, anonymous stories of sexual harassment and abuse in academia, extracted from a survey by Karen Kelsky (2017), are used to inform a digital visualisation (also with an audio component) using a metaphor of knots, "positioned in the space according to three different modalities: incidents similarity,

³ Also relevant here: a notable recent workshop at CHI, Wirfs-Brock et al (2022), made use of 'sketching' sound, taste, and touch, as a way to explore the potential of synaesthesia-inspired design (C.H. Lee et al, 2019) in mapping data in more experiential ways.

role of victim and role of perpetrator” (Elli et al, 2022, p.13). The authors share insights on their process, and reflections on the use of visualisation to provoke or support emotional connections with sensitive topics and real people’s stories behind the data.

Lorenza Abbate and Cristina Marino (2022) take us into the world of museums, where data visualisation, and increasingly, physicalisation, are no longer only about communicating information, but also about expression, facilitating interaction and “activat[ing] participatory process in understanding complex phenomena” (p.2). ‘Designing data interaction in exhibitions contexts’ examines case studies via a lens of the degree of transformation of information, using these to explore factors affecting the exhibition context and the role of different design strategies in affecting the interactive experience. Physicalisation is also the subject of Žarko Dumičić, Katja Thoring, Hermann W. Klöckner, and Gesche Joost’s (2022) paper ‘Design Elements in Data Physicalization: A Systematic Literature Review’, which examines 163 published examines and extracts insights around characteristics such as scale, the use of metaphors, different materials, and interactivity. They note that while “senses other than sight are not as direct in data communication, [they can] provide a qualitative experience of information” (p.21), and that “unconventional materials” can increase engagement.⁴

Indeed, it is data *materialisation* (Lean, 2020; 2021) that Marion Lean and Cate Hopkins address in ‘Exploring contexts for data materialisation in post-pandemic research activities with rural communities’. Lean and Hopkins (2022) look at how “rather than a representation of data, materialisation concerns the whole experience of that data engaged with by the viewer, in the material world”, using “embodied experiences... including a board game and physical postcards” to examine the needs and potential uses of rural broadband, to inform policy. Laetitia Forst (2022) uses materials—specifically, textiles—as part of methods for doing research, framing problem spaces, and developing ideas, in the ‘future fashion systems’ context. Here, in the paper ‘Textile thinking in practice: Creative textile design methods as research in a circular economy’, the work involves making hidden, tacit knowledge more visible and apparent in the design process. Beyond the specifics of materials themselves, in ‘Investigating materiality for a renewed focus on data design practice, Youngsil Lee, Larissa Pschetz, and Chris Speed (2022) consider *materiality* within data practices, including how designers’ work can play a role in theoretical and philosophical discussions of data materiality through the production of examples.

Continuing with the focus on design practice—and examples—Lockton, Lallemand, and Menheere (2022) explore ‘Designing Qualitative Interfaces: Experiences from Studio Education’, specifically chronicling practical applications, at TU Eindhoven and at Carnegie Mellon, of the idea of ‘qualitative interfaces’ in interaction design studio projects, seeing if and how the theory developed in Lockton et al (2017) works in practice in an educational

⁴ In a highly relevant recent paper, Kim Sauvé, Miriam Sturdee, and Steven Houben (2022) introduce the notion of *physecolology* as a broader ecology for physicalisations, which, while not explicitly focusing on the qualitative, nevertheless touches on different forms of “input-output coupling”.

setting. The projects often have a focus on personal informatics—including running training—which is also developed in more detail in ‘Hyaku: A Qualitative Negotiation-Through-Interaction Interface to Support Runners in Achieving Balanced Training Sessions’ by Juan Restrepo-Villamizer, Steven Vos, Evert Verhagen, and Carine Lallemand. Restrepo-Villamizer et al (2022) created ‘Tradeables’, a form of qualitative interface in which recreational runners can adjust the recommendations delivered by a system, through “trade-off[s] between objective sensor evaluation and subjective feelings”.

Finally, two papers with overlapping co-authors offer some new perspectives on personal informatics from a standpoint connecting theory and practice. Kim Snooks, Roger Whitham, Daniel Richards, and Joseph Lindley (2022) look ‘Beyond the body: Moving past the metricised bodily goal in self-tracking’, examining possibilities and opportunities for going beyond measuring bodily data, while Emily Winter, Bran Knowles, Daniel Richards, Kim Snooks, and Chris Speed (2022) focus on “how the self is conceptualised in tool design”, in ‘Multitudes: widening the research agenda for Personal Informatics design’. Winter et al (2022) suggest new design spaces for personal informatics which open up new design opportunities, for qualitative as well as quantitative approaches.

A track chair’s reflection on bias and viewpoint in the papers

In research, many of us are taught that we ‘must not be biased’, yet if design is a vehicle for bringing about change then we must design through a lens that we believe will bring about positive impacts. Bias is about revealing or concealing prejudice. Use of colour in graphical information display to provoke or persuade for example to generate product sales is well established, but how does material, sound or movement disrupt our data experiences and why should we accept this novel format for propaganda?

The applications and contexts for creative data experiences in this track present a certain vulnerability with designers presenting their visions of what is ‘right’ for the future through novel interaction systems, language and framing for designers working with data, and disciplinary specific methodology to adapt for design research. But isn’t making things ‘better’ what design is all about? Together in this track we see authors drawing on their biases to envision what ‘better’ looks and feels like. Through this collection of reports on encounters with data we find space to visually and materially conceptualise proposals for ‘better’ engagement for community empowerment in Elli et al (2022) and in Lean and Hopkins (2022), for ‘better’ systems for circular design in Forst (2022), for ‘better’ fitness levels and interactions with the elements in Lockton et al (2022), or for ‘better’ language to discuss how we as data practitioners in design research think information could, or should be experienced in Y. Lee et al (2022). We apply our own bias cut over the warp and weft of design and research. These papers stretch the fabric or bend the rules by prototyping alternative suggestions to interact with different types of bias through data experience. This facilitates the opportunity to cast critical perspectives on design’s perceived agendas for better. In this context a lack of bias is a lack of diversity, thus we celebrate this range of

positions and proposals for materials and methods that value the qualitative in design and data- bring on the bias!

3. Beyond the papers

December 2021 saw the first international design symposium on *Qualitative Phenomena, Data, Interfaces, and Representations*, organised by Chang Hee Lee, Assistant Professor of Industrial Design and Director of the Affective Systems and Cognition Lab at Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, South Korea. This online event brought together a group of researchers working in this area—current DRS track chairs Daphne Menheere, Dan Lockton, and Chang Hee Lee himself, with Bjorn Sommer from the Royal College of Art, and Raphael Kim from Queen Mary, University of London.

A notable feature was the intersection of qualitative approaches with nature—Kim’s work on microbial aesthetics, as part of exploring ‘bacterial computing’ (Kim & Poslad, 2019) and viruses as material for interaction design (Kim, 2021), and Sommer’s on modelling and representation in biology (and the role of biomaterials in design, e.g. Sayuti et al (2022)) add a dimension which, explicitly or otherwise, recognises some of the same points made earlier in this editorial, and indeed in some of the track papers, around the ways that our experience of (constructing) meaning in relation to the ‘real world’ is often through engagement with the analogue forms of natural processes. Digital data is a human construct, and the analogue-to-digital conversion that mediates so much of the way technology enables us to interface with the natural world, inherently obfuscates some of the qualities of the original phenomena, in creating an abstracted, manipulable model.

Perhaps then the natural world—in a more-than-human sense—is one potential direction for qualitative design and data research to progress, embodying materials but also living processes and dynamics (or the notion of the entire world as a kind of analogue computer (Offenhuber & Parkhomenko, 2021), which are very different to those commonly (so far) dealt with in most human-computer interaction and interaction design. But it may also be that it is not just the more-than-human, but the more (honestly?) human which should be part of this trend, from the kinds of ways of thinking about the self that Winter et al (2022) consider, to the bodily materials and fluids which, elsewhere at DRS, Juul Søndergaard and Balaam (2022) and their authors are considering in another track.

As noted earlier, the framing of this track, and the topic, are extremely broad, and we do not seek to determine or shape particular research directions or applications around the qualitative. Our aim is, rather, that by bringing together a group of researchers interested in this way of designing—or even connecting a few relevant approaches—collectively we can demonstrate the possibilities and opportunities of a more qualitative perspective. Through examples, methods, and theoretical perspectives, we can learn from each other (and apply each other’s ideas in our research), and inspire others; we hope that this selection of papers opens up some new thinking for you.

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