SIG on Data as Human-Centered Design Material

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ABSTRACT

Behavioral data is ubiquitous in products, services, and systems that people interact with. It is increasingly used by design and HCI researchers and practitioners throughout their human-centered and participatory design processes. The highly dynamic nature of behavioral data makes it deeply intertwined with people, their behavior, and their experiences. Thus, it presents unique opportunities and challenges. This Special Interest Group will provide a space to reflect and discuss effective and responsible ways to engage with behavioral data in human-centered design processes. We will explore questions about the types and scale of data used, the contexts in which data is embedded and applied, the methods we rely on, and the forms of engagement of the multiple stakeholders. In doing so, our goal is to collaboratively develop a research agenda, setting the scope for an annual, international symposium on Data-Centric Design.

CCS CONCEPTS

• **Human-centered computing** → **Interaction design process and methods**.

KEYWORDS

Human-Centered Design; Behavioral Data; Participatory Design; Data-Centric Design;

1 INTRODUCTION

Behavioral data is intrinsic to the digital world we live in. It is generated, collected and stored as we navigate physical (e.g., public transport) and digital (e.g., social media) spaces. Hence, it offers a unique perspective of our behavior and experience grounded across time and space. For example, looking at her activity tracker, a data participant could say "in 2020 I was often at home, trying to exercise and keep my daily steps constant; now I move more, but every day is different, and my daily steps vary a lot." For this reason, design and HCI researchers increasingly integrate behavioral data into their human-centered and participatory design processes (e.g., [3, 4, 10, 18]).

Behavioral data is highly personal. Hence, being part of these participatory processes invites people to engage with their data, which reflects their behavior and serves as a tool for self-reflection. For example, looking at her activity tracker, the same participant could say "my daily steps were below my goal for two days when I was sick". In this context, design and HCI researchers support

people's engagement with their behavioral data; helping them (1) navigate existing data protection regulations [5, 8], (2) categorize and visualize the data and, in doing so, understand it and its implications [13, 17], and (3) interpret and situate the data [8, 13, 18, 19].

In practice, engaging with behavioral data poses several practical challenges for design and HCI researchers, some of these are well-documented in the literature [11, 16]. For instance, (1) being compliant with regulatory processes that push for anonymization, (2) collecting, manipulating, and shaping the data in a way that fits and supports people's needs and abilities, and (3) making sense of the data and combining (sometimes contrasting) information from multiple sources and in multiple formats.

As part of the emergent Data-Centric Design community, we believe that having an exchange on ways of working with behavioral data and the challenges we face in doing so, would help to define the foundations of future data-centric design practices, methods, and approaches. This community evolved from a workshop on 'Designing with Behavioral Data' held (online and in-person) during the Dutch Design Week 2021[1] in October, 2021.

2 SIG GOAL

CHI'22 was the first milestone of this Special Interest Group [9], where we mapped the emerging community and established three aims:

(1) **Identify Best Practices** – How and where in the design process is behavioral data collected, applied, and validated? What is a *designerly* take on collecting and using behavioral data throughout a process that is dynamic and iterative?

(2) **Co-develop Appropriate Tools** – How to foster collaboration between designers and data scientists to create accessible, designer-friendly tools that enable a creative and holistic engagement with data? What are the existing tools and methods that support designers in using data as creative design material?

(3) **Educate Stakeholders** – How to establish a common ground on responsibly setting up and running designerly, data-intensive projects with regulatory bodies (i.e., HREC, IRB)? How to reduce the frictions that emerge from an exploratory, rather than an evaluative, approach to data-intensive activities?

The main outcome of the CHI'22 SIG was a map, collaboratively developed by all participants and remaining open as a living document. It provides an overview of the state of the art in our field, illustrating the type of activities and perspectives through which we engage with behavioral data. In addition, the CHI '22 SIG connected us, growing through a Slack online space[2], international events, including introductory courses at CHI '22 and NordiCHI '22 [14, 15], and monthly conversations, where community members introduce themselves and their ways of working with behavioral data[3]. These activities helped us iteratively draft three core focus areas:

- **Data Creation and Access.** The ways data is captured shape the conversations it supports. How do we collect or generate behavioral data? Access to behavioral data often relies on the design and development of probes and prototypes (e.g., [4, 18, 19]). How do prototypes shape the data? Can we rely on alternative ways to access behavioral data (e.g., crowdsourcing [17], data donation [8])? How do these approaches fit and challenge existing data protection regulations and privacy considerations (e.g., the European General Data Protection Regulation [5])? To what extent do these approaches reinforce or mitigate existing inequalities [7]?

- **Data Mediation and Interaction.** The way(s) we represent the data to support interpretation and discussion play a critical role on the insights that emerge. How do we represent and shape behavioral data? Behavioral data is often represented visually through static and dynamic data visualizations (e.g., [13, 17]) and dashboards (e.g., [2, 3, 18]). How does the way we represent data influence our design (processes) and our interactions with stakeholders? What factors influence the way we represent data? What tools and techniques do we rely on? What are other ways and means we could use to represent and shape the data (e.g., physical and tangible [1, 12, 20], audible [21])?

- **Collaboration around Data.** While the lens is 'data-centric' – revolving around and supported by behavioral data – the research processes are fundamentally human-centered and participatory (e.g., [6, 13, 19]). But who is involved and how? When reporting our experiences with behavioral data, we often fail to shed light on the many hands involved in generating, collecting, storing, processing, analyzing, and visualizing the data [7]. Bringing visibility to those involved throughout a data-centric design process can better inform and support future designers and researchers engaging in similar activities.

CHI is the core venue of our interdisciplinary community. Hence, CHI'23 offers a unique moment for members of our community to align in time if not in space as we favor the hybrid format. With its visibility and credibility, CHI'23 represents a critical opportunity to strengthen and further expand our community beyond our existing structures (e.g., conversations, and courses). During the CHI'23 SIG-CHI event, we aim to collectively and collaboratively develop a Data-Centric Design research agenda, leveraging the three focus areas above as the starting point. This collaboratively defined research agenda will foster meaningful collaborations and feed the organization of an annual, international symposium on Data-Centric Design. Attendees of the SIG-CHI event will form the foundation for a program committee of the symposium.

3 DESCRIPTION OF THE COMMUNITY

The Data-Centric Design community is a growing community of researchers and practitioners at the intersection of Human-Computer Interaction, Participatory Design, and Personal Informatics. As organizers, we have a strong foothold in these three areas. However, we envision engaging with a broader network of researchers and industry partners from other disciplines, where behavioral data offers similar opportunities. The availability of behavioral data is changing the way academia and industry access and leverage data to generate knowledge. This SIG is thus also relevant to a broad

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[1]The Dutch Design Week is an annual international design event taking place in Eindhoven, The Netherlands. More information: ddw.nl
[2]Join the Data-Centric Design community on Slack: edu.nl/wumw3
[3]Past and upcoming conversations datacentricdesign.org

spectrum of disciplines, including social sciences, anthropology, psychology, interaction design, computer science, human-computer interaction, and engineering. Finally, we aim to connect and engage with regulatory bodies such as ethics committee members and data privacy officers.

We recognize an urgent need for strengthening the international, multi-disciplinary community across academia and industry focusing on the use of behavioral data throughout the design process of product-service systems. We believe that CHI is the venue that fits this ambition due to its scale, interdisciplinary community, and inclusive environment.

4 GOING FURTHER: NEXT STEP

CHI '23 is a milestone in developing an international community on Human-Centered Design with data across design researchers and practitioners. Beyond this event, we aim to:

- Iterate on and publish a Data-Centric Design research agenda.
- Continue monthly conversations and intensify interactions and collaborations through Slack.
- Initiate the organization of an annual, international symposium on Data-Centric Design using the research agenda as scope.

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