# Moving and Crafting Data Together: Critical and Feminist Perspectives on Technologies for Movement through Movement


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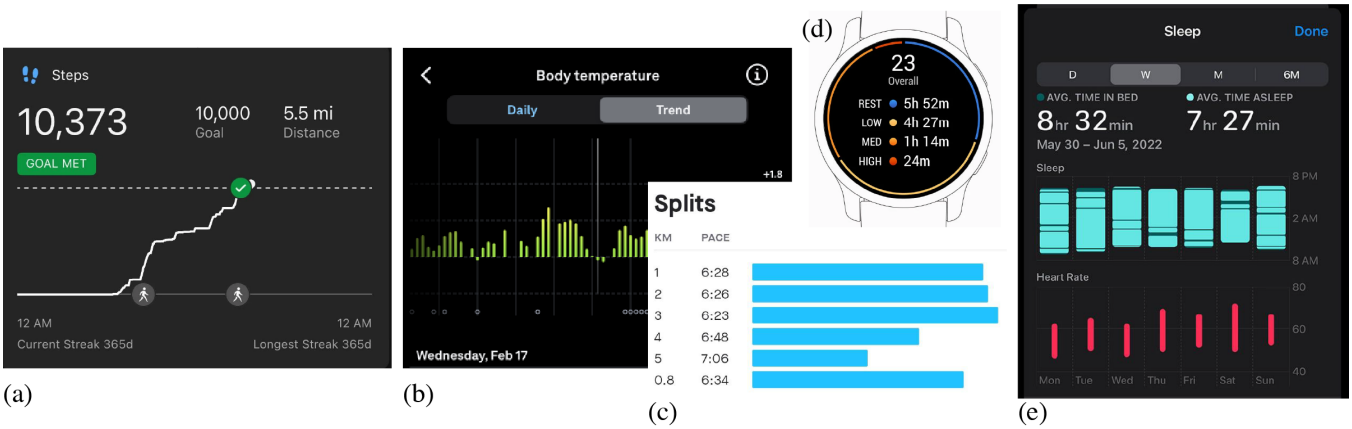


**Figure 1: Examples of various data representations related to movement and physical activity. Including: (a) daily steps visualised with a line on the Garmin app, (b) body temperature visualised with a bar chart on the Oura Ring app, (c) pace splits during a run visualised with a bar chart on the Strava app, (d) stress scores visualised with a donut chart on the Garmin watch interface, and (e) daily sleep and heart rate variations visualised with bar charts on Apple Health.**


## Abstract

There is a growing interest in navigating the tensions between emerging technologies designed for movement and physical activity, and how people (mis)use and appropriate them. These include whether technologies are helpful or harmful, enhance or distort lived experiences, and the gap between what data captures, how it is represented and visualized, and what it inevitably renders invisible. This 1-day workshop aims to bring together interaction designers, HCI researchers, and practitioners who engage in movement and physical activity to unpack, explore, and critique these tensions (and beyond) through movement. Together, we will participate in a guided movement session, collect various forms of data, and craft representations of these data to foster reflection and critique. Our workshop aims to contribute to developing a shared design agenda to interrogate, challenge, and reshape the future of digital technologies and data that foster engagement with movement and physical activity beyond quantification and static data representations.




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## CCS Concepts

• **Human-centered computing** → **Empirical studies in interaction design**; **Interaction paradigms**.

## Keywords

Physical Activity; Sports; Personal Data; Data Visualization; Data Physicalization; Crafting;

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## 1 Background

Movement and physical activity are increasingly mediated by technological interventions, such as wearable tracking devices and digital apps offering personalised training, lifestyle, and nutrition advice [25]. These interventions heavily rely on datafying (and primarily quantifying) movement, physical activity (e.g., walking, running, swimming), and other factors that influence these, such as rest, nutrition, and the menstrual cycle [10, 27, 37]. Thus, these technological interventions continuously collect and store various types of personal, sensitive, and intimate data (e.g. [3, 5, 7]), including: (1) digital communications (e.g., messages of encouragement, likes, photos), (2) equipment (e.g., running shoes, bike model), (3) physical activity (e.g. daily steps, frequent running routes), (4) self-reported physiological signals (e.g., food intake, date of menstruation, symptoms), and (5) sensed physiological signals (e.g., resting heart rate, respiratory rate, glucose levels), among many others [36]. Further, interactions with these data are primarily mediated by static data visualizations, including bar charts, pie charts, and line charts (See Fig. 1).

There is plenty of work in Human-Computer Interaction (HCI) and beyond that critiques the values and biases embedded in these technologies and the resulting data (e.g., [31]). For instance, how datafication reduces a complex embodied experience into discrete and decontextualised data points [22], how data and metrics are often difficult to interpret and act upon [5, 6, 8, 37], or how the narrow focus on performance and productivity disregards important aspects of people's overall experiences with movement and physical activity, such as hormonal fluctuations [2], injuries [29], chronic conditions [9], and life beyond exercise [12]. Furthermore, movement datasets, which inform the underlying metrics and data in technological interventions, narrowly represent certain bodies and do not account for nuances and diversity in activity, leading to a concerning absence of disabled bodies engaging in sports or other leisure activities [23, 32].

At the same time, there are perspectives that illustrate how digital technologies and data, even when flawed and decontextualized, can be insightful and are welcomed into the daily routines of professional, semi-professional, and amateur athletes, dancers, and other people who move in their day-to-day (e.g., [5, 33, 35, 37]). Notably, these technologies have been reclaimed and appropriated by communities with chronic health conditions as helpful tools to manage their health independently of their intended purpose [14, 19]. Along the same lines, with sensing and tracking systems easier to tinker with and reconfigure, an emerging field of research delves into the materiality of interacting with data and data representations to challenge how embodied knowledge is formed [1]. These approaches, centered on material representations, have proved to be accessible to anyone [15, 16], allow personal self-reflection [34], and are particularly interesting for expressing qualitative aspects [21]. In an attempt to emancipate interactions with tracked data from medicalized assumptions, Homewood et al. [13] designed a jewelry artifact that allows the wearer to interact haptically with their heart rate as an act of slowing down. Similarly, Sauvé et al. [30] designed an abstract representation of physical activity data to support people appropriating their data and engaging with it outside the screens of mobile phones and tablets.

In this workshop, we aim to bring together members of the DIS community who practice any form of physical activity and engage in self-tracking or data representation to explore their experiences (re)configuring, appropriating, and engaging with the materiality of their data. We will collectively interrogate how people live with, negotiate, represent, and reappropriate data in relation to their embodied, social, and moral worlds. Thus, moving beyond understanding "successful" engagement with movement technologies and data as compliance, optimization, or behavior change, and towards ongoing negotiation, care, labor, and adaptation. Our workshop would be of interest to designers, researchers, and practitioners working on topics related to (1) soma design, movement, physical activity, and sports, (2) personal informatics, (3) data interpretation, visualization, and physicalization, (4) critical and feminist perspectives on data, and (5) body-based interaction. Through our workshop, we expect to contribute towards the design of movement technologies and data that are interactional, experiential, material, and relational.

## 2 Goals and Motivation

This workshop will explore how tracking technologies for movement and physical activity and the data they produce are designed and configured, and how people with different bodies, abilities, and life circumstances experience, interpret, and (re)appropriate them. This is important because current design and evaluation frameworks tend to prioritize technical performance, behavioral outcomes, and scalability, while paying limited attention to how these systems become embedded in everyday routines, identities, social negotiation, and care practices. We expect to bring together designers, researchers, and practitioners **who engage in any kind of movement and physical activity** to explore and expand on these tensions through discussions centered on moving, gathering data, and creatively engaging with data. Specifically, we expect to discuss the following aspects:

- **Usefulness vs. Uselessness:** Digital technologies and the data they produce are positioned as valuable tools for improving performance and wellbeing, yet at the same time, they risk being redundant, distracting, or even counterproductive.
- **Shaping vs. Distorting the Movement Experience**: Digital technologies and the data they produce can improve and motivate our engagement with movement and physical activity, but they can also constrain, distort, or narrow how these experiences are lived and valued.
- **Captured vs. Uncaptured Realities:** Data promises to offer comprehensive insight, but inevitably leaves out important aspects due to how data is configured and represented.

We have noticed some of these tensions in our own experiences at the intersection of digital technologies, movement, and physical

activity. For example, we can be frustrated by how our wearable device quantifies and misrepresents our "training load" or the qualities of the "after training" period, while at the same time acknowledging the usefulness of digital technologies for managing and monitoring our physical activity. Similarly, we can feel uncomfortable with pervasive intimate data collection about our bodies while, at the same time, we wish for our data to be richer and more nuanced [9]. Some of these tensions have been explored in prior research in relation to time, expertise, and access to data (e.g., [4, 11, 18, 28]). In this workshop, we do not expect to reconcile the above-mentioned tensions but to unpack the different actors and factors at play and to bring forward diverse voices and experiences.

While DIS and related venues have hosted workshops on quantified self and personal informatics [20], health technologies [26], and sports HCI [17], running visualization [24], these have often focused on specific application domains, technical challenges, or individual behavior change. Fewer venues have explicitly centered the embodied, relational, and ethical tensions that arise when movement technologies are integrated into everyday life across diverse bodies, abilities, and contexts [34]. Our workshop responds to this movement by bringing together a diverse community to articulate alternative trajectories for movement technologies that emphasize plurality, care, and situated meaning-making.

## 3 Anticipated Outcomes

Our workshop will be organized as an embodied and participatory exploration rather than a conventional discussion session. Our aim is to create a space where participants engage with both their bodies, their data, and their experiences with digital technologies for movement, foregrounding tensions rather than seeking resolution. The workshop will be centered on unpacking: (1) Whose expertise and assumptions are embedded in technologies for movement, and how do these (mis)shape how we experience our bodies in movement? (2) How can we be critical of technology for movement while simultaneously engaging with it as a somewhat useful and helpful part of our daily movement and physical activity? (3) How can we incorporate critical and feminist perspectives into the interactions with data mediated by technologies for movement?

We anticipate the following outcomes:

- **Shared Knowledge and Experiences**: This workshop is a unique opportunity for participants to share knowledge and experiences on how they engage with their movement and physical activity data, with a special focus on what data fails to convey and how participants appropriate their data. We anticipate bringing together researchers and practitioners working across domains such as sports, rehabilitation, chronic illness, leisure, and everyday fitness. Thus, we envision the workshop as an opportunity for collaboration and critique, where our shared experiences will help us identify tensions and design opportunities.
- **Creative Explorations of Movement Data**: Participants will collaboratively craft visual, narrative, or material representations of their data that move beyond the conventional visualizations available through most self-tracking technologies (e.g., bar charts, pie charts). Organizers have experience crafting artifacts and tools for people to explore data digitally and physically. We will leverage this expertise to help people create and reflect on their own data.
- **Shared Vocabulary**: We will identify some of the key tensions at the intersection of physical activity, datafication, and data representation and develop a shared vocabulary to articulate these. Through collective discussion and embodied engagement, we will refine and extend the proposed tensions and identify additional dimensions that shape how movement data is produced, interpreted, and acted upon. This shared language will support future research and design work that moves beyond purely instrumental or optimization-driven framings.
- **Potential Collaborations and Next Steps**: We aim to nurture possible collaborations and projects around physical activity, data, and creative representations, potentially leading to future publications and activities. For instance, projects that foreground design-oriented insights and strategies for engaging with the tensions we identify in practice. In this way, the workshop will connect researchers and participants working on personal informatics, data representation, SportsHCI, health technologies, disability studies, feminist HCI, and design for wellbeing, facilitating sustained dialogue beyond disciplinary and topical boundaries. We aim to establish an ongoing network of researchers interested in developing alternative paradigms for movement technologies.

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