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Ecological data for manifesting the entanglement of more-than-human livingness

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ABSTRACT

Data in Design and HCI research is often associated with something captured from the world in digital form and transferred to a database. However, the assumption of digitalisation, as well as the intentions and values underlying it, can obscure more nuanced approaches to data, and is becoming increasingly criticised (e.g., through notions of data colonialism, data extractivism, etc.). In this workshop, we invite participants to critically review data concepts and practices that sustain Western industrialised socio-economic systems, considering their ethical, environmental, and ecological implications. In contrast, we will explore data in the entangled ecologies of organisms, matter, and environments, focusing on 'livingness' as a way to reveal embodied, relational, and situated aspects of data. Through wandering and foraging, we will discuss how these aspects of data might help us regain our attentiveness, appreciation, and responsibility towards more-than-human ecologies, and ultimately reframe concepts of data in the world.

CCS CONCEPTS

• **Human-centered computing** → **Participatory design**.

KEYWORDS

ecological data, embodiment, relationality, situatedness, more-than-human

1 BACKGROUND AND MOTIVATION

Researchers and designers in diverse fields have long looked at ways in which data can inform their practice, in what could be seen as designing "from" data. However, they are increasingly looking at ways in which design can be carried out "with" and "by" data [26]. Oftentimes, this shift assumes data to be captured in a digital form, which is then structured (e.g., through datasets) and incorporated into research and designs. This trend is also prevalent in handling ecological data, which is gathered to study how organisms interact with their environment [21, 32]. However, the assumption of digitisation often sidelines local and tangible data fluxes and differences that are intrinsically connected to, and 'given' by, the

lives and contextual relationships of organisms, matter, and specific environments [4, 16]. In this workshop, we invite HCI and design researchers to consider pre-digital data forms (and indeed expand on them) to ask: What happens if we look beyond digital datasets and into the lifeworld to extend notions of data? What kinds of values, meanings, and contexts emerge? How can design help to leverage this new complexity?

Data is often referred to as the "new oil" [2], playing a significant role in shaping socio-economic systems on a global scale. However, the prevailing understanding of data, which can be 'taken' and 'extracted' through observations, computations, experiments, and record-keeping [13], is widely critiqued by social scientists, who argue that this perception has fuelled the view of data as a resource for endless economic growth and enhancement of a fraction of humans [6, 10] through the so-called rise of "big data" and "datafication". They insist that these tendencies have raised social, environmental, ecological, and ethical concerns [6, 7], which are manifested through concepts such as data colonialism [9, 22], data capitalism [25], data surveillance [29, 31], and data extractivism [6]. Jansen (as cited in Becker's paper [5]) discusses how the meaning and role of data have become quite contrary to the word's etymology:

> It is an unfortunate accident of history that the term datum (Latin, past par ticiple of dare, 'to give') rather than captum (Latin, past participle of capere, 'to take') should have come to symbolize the unit-phenomenon in science. For science deals, not with 'that which has been given' by nature to the scientist, but with 'that which has been taken' or selected from nature by the scientist in accordance with his purpose. (p.279)

As a response to this, our workshop focuses on 'livingness' (i.e., the state or quality of being alive, which is perceived as the evolving bodies, agencies and rhythms of organisms) and interpretations of data as 'given' by nature [16], as a way to critique and reimagine such data concepts and practices. We will look at data as tangible, relational and 'becoming with' the environment [16], reimagining it as attributes of the living world [15]. This way, we will seek to broaden our understanding of data to include "the intricate interdependence between humans, animals, plants and other entities within ecological frameworks" [16]. We contrast this approach to mainstream interpretations of "data science" [20] which often promote 'anthropocentric' values that are in fact modern capitalist ones - as discussed by Tsing (2015) [28], "imagining the human [anthropo-] since the rise of capitalism entangles us with ideas of progress and with the spread of techniques of alienation that turn both humans and other beings into resources". (p.19)

Therefore, the workshop will engage with participants to re-sensitise, re-contextualise, and reimagine possible ecological worlds in a designerly way, reflecting on the multiple forms of data 'given' by living organisms and nature [16]. We will accomplish this by centring living organisms in specific contexts, rethinking data in nature (which may be in the pre-digital data form as in the initial phase of gathering information from the physical world) and reimagining their dynamic relationships with humans, other-than-humans, and the environment in a given location. We will adopt a tangible and hands-on approach, through which we will feel, ask, and reflect on alternative forms of data and how they can help acknowledge the existence of other beings (and reconnect with them) to reconcile human and other-than-human worlds.

Programmatically, the workshop will explore the 1) embodied, 2) relational, and 3) situated aspects of data in the world that can enrich our understanding of more-than-human ecological dimensions, as discussed below.

2 THEMES AND GOALS

In the workshop, we explore what design approaches and methods can contribute to rethinking data from an ecological perspective, i.e. one that understands knowledge to be entangled, situated, indeterminate, and made meaningful by the interpretations attributed to it, which are not to be separated from the flows and interrelations of the context in which it is created. It is divided into three phases, which are correlated with the exploration of three aspects of data and questions, as follows:

Embodiment

"How can we perceive embodied data from multispecies and their environment through design?" Embodiment refers to the state of manifesting a physical form through interactions within the entangled web of lives, relationships, movements, and rhythms. Living organisms continuously adapt to their environment through "material practices of knowing and becoming" [4] and evolve their bodies and characteristics. For humans and sentient beings, embodiment encompasses physical, emotional, and sensory cognitive capacities and experiences [12, 17], enacted through the use of tools [8], movement, creation, and action [30].

In the first phase of our workshop, we will explore data using our senses through a foraging activity. The activity will explore 'embodied' data by observing and sensitising us towards the natural environment outside the conference venue. The aim is to attune ourselves to the livingness of organisms and their environment, which is more akin to a verb than a noun. As the biologist Lynn Margulis notes, "Life on Earth is more like a verb. It repairs, maintains, re-creates, and outdoes itself" [19]. This data may be evident in the smells, bodies, movements, sounds, and rhythms, and may indeed be difficult to articulate in words.

Relationality

"How can we explore relational data for multispecies inter-relations, rather than individual subjectivities?" Relationality refers to the interconnectedness of beings, where each is shaped by, and in turn shapes, others and the environment [3]. This concept highlights the dynamic, uncertain, and multiple nature of relationships, emphasising that no person or object exists in isolation [14]. It is frequently linked with notions such as "intra-actions" (emphasising that distinct agencies don't precede relations, but instead, they emerge through them) [3] and "trans-corporeal transformations" (foregrounding material flows and interchanges across species and dismantling human environmental dichotomies in the process) [1].

In the second phase of our workshop, we will use the foraged data given by nature to contextualise their 'relations' within: their original contexts, other foraged data, emerging data (by further experiencing the foraged data), other forms of data (i.e., our own research-related artefacts and things), and our bodies. To accomplish this, we will use various physical materials and strings to

physically represent their intertwined connections and relationships, and explore tactics to create a further feeling for this data, such as through eating the data [18].

Situatedness

"How might we use design to consider situated data as directly interpreted by multispecies, without the need for human mediation?" Situatedness speaks to contextual elements that affect perceptions, responses, and ways of being that are continuously constructed, negotiated, and contested for coexistence. In contrast to the abstract "unlocatable", "irresponsible" (unable to be called into account) [11] world of science, situated knowledges are "partial, embodied, locatable, critical" [11], and where "ways of being are emergent effects of encounters" (p.23) [28]. The organisers have explored the concept of situatedness across different contexts, taking into account aspects like temporality and cohabitation in their design work. This involves living and designing with everyday actions, natural rhythms, and the life-cycles of multispecies [23, 24, 27].

In the final phase of our workshop, we will 're-situate' data within their original environment, expanding their relationships by reflecting and reimagining how we could reconnect with and 'give the data back' to living organisms. We will speculate on how, when, and why they may impact multispecies' coadaptation and cohabitation (e.g., how does the data influence the sense of belonging and autonomy across multispecies?). Subsequently, we will speculate on potential more-than-human ecologies, landscapes, and assemblages.

Towards a manifesto

The turning of attention to the 'livingness' of natural matter, living organisms, atomic and cosmic scales through ecological data lead us to a manifesto based on three principles:

- Attentiveness: The importance of noticing and acknowledging the lively existence of multispecies and their active participation, particularly those beyond humans, machines, and highly domesticated species.
- Responsiveness: The necessity to respond to differences and emergences of ecological data that result from unknown encounters and contingencies from the lived experiences and lives of beings in the physical world, whether or not these are accessible to (sensible by) humans and their tools.
- Care-fullness: The need to continually revisit our own practices, as well as the artefacts and systems we design. This approach fosters more meaningful engagement with the physical world and highlights a sense of responsibility for impacts on more-than-human worlds.

3 EXECUTION OF WORKSHOP

Part of the workshop activities described above will be carried out outdoors, at the Amager Fælled natural reserve. We will count on the knowledge of a local foraging expert to ensure participant safety during hands-on design activities, which may involve touching, smelling, and eating. In relation to inclusion and accessibility during our workshop's outdoor activity, we will ensure that participants with mobility issues can communicate with us beforehand in order to provide the best possible support.

4 ANTICIPATED OUTCOMES

Our goal is to develop a working group around new notions of ecological data and related practices, in collaboration with other researchers in Human-Computer Interaction (HCI) and Design. Through the workshop, we hope to enrich our discussion on the design manifesto, methods and practices, which could later take the form of a journal special issue (e.g. TOCHI, Journal of Human-Computer Interaction). We anticipate that this approach may help the field to review datasets, data practices, and systems; and expand understanding of data ecologies involving matter, objects, organisms, and ecosystems.

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