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Grasping Data: Exploring interdisciplinary approaches for investigating children's interactions with their personal data

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Abstract

Unlike any previous generation, children's lives are now highly datafied, tracked, and digitally monitored. They are increasingly vulnerable to data collection from seemingly innocuous toys and devices with cameras, sensors, voice recognition, and geolocation. Yet, children typically lack awareness or control over these data exchanges, as consent is usually given by adult caregivers (who may also lack data literacy). Despite regulatory improvements, interdisciplinary approaches remain crucial to empowering children to understand, value, and manage their personal data. How can the IDC community involve children in the design and use of their personal data? This workshop unites experts to explore current practices. [1]

CCS Concepts

• **Security and privacy** → **Social aspects of security and privacy**; • **Human-centered computing** → **Interaction design theory, concepts and paradigms**; **HCI design and evaluation methods**; **Visualization theory, concepts and paradigms**.

Keywords

Children, personal data, data understanding, data literacy

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[1]This workshop merged with "Towards a Research Agenda for Including Children and their Care Ecosystems in HCI" to run a joint workshop: Grasping Data Together: Interdisciplinary Agendas for Engaging Children and their Care Ecosystems with their personal data

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1 Background

This workshop seeks to map the IDC community's approach to designing with and for children in exploring their personal data. While public awareness of data exploitation is rising, efforts to promote understanding how data is harvested remain limited [2]. Children face increasing risks from seemingly innocuous toys and devices that capture data through voice recognition, geolocation, sensors, and cameras [8]. These technologies allow third parties to 'know' a child's birthday, heart rate, and location, and even monitor personal habits and conversations. Despite some progress in regulation and design guidelines [3], interdisciplinary work on directly empowering children remains scarce. In line with the General Data Protection Regulation (GDPR) [5], we define personal data as information that can identify individuals and reveal insights about them. Policy efforts [5] highlight the urgency of promoting

data literacy from an early age, yet clear pathways for empowering children remain lacking. For children aged 9-16, personal data literacy involves understanding how data is generated, interpreted, and managed, along with its broader implications [10]. Existing research primarily focuses on voluntary data sharing (e.g., names) in children over eight [11], while studies on younger children (3-8 years) are limited and often exclude their voices. Although pedagogical tools for data literacy are emerging, there remains a gap in making activities personal, meaningful, and engaging for younger children. IDC researchers employ diverse participatory methods to examine personal data contexts, often with adults [6], and, to a lesser extent, with children [4, 7, 9]. The 5Rights Foundation [1] has challenged the lack of children's agency over personal data through 'Twisted Toys'—a provocative exploration of how data-driven toys manipulate and control children. These creative approaches push the boundaries of how we engage with this issue. Indeed, some of the organisers of this workshop have begun to explore these issues through innovative methods such as data physicalisation in a new UKRI-funded interdisciplinary grant. The "Grasping Data" project addresses the societal need for personal agency in an increasingly datafied world, recognising that, as society's youngest members, children's futures are most impacted by the imbalance between those who give and profit from personal data.

1.1 Questions the workshop will pose

- How do we support children to understand and value their personal data?
- What are colleagues' existing work and interests around children, personal data, and CYP?
- What steps can we as a community take to ensure children are kept safe and have agency over their data?
- What works, with which age groups, and in which design contexts?

1.2 Workshop Goals

(1) To understand where and how children are being included in research and design in the IDC community, which concerns itself with their personal data.
(2) To create an explorative visual mapping of the theoretical approaches and methods used by the IDC community around children and personal data.
(3) To converge on a set of principles or a manifesto for the design community to follow on best practice in such contexts.

2 ORGANISERS

Dr Ayça Atabey is a post-doctoral researcher at the University of Edinburgh, conducting interdisciplinary research at the intersection of AI regulation and Child-Computer Interaction. A former PhD Awardee at the Alan Turing Institute, she focused on child-centred AI and ethical personal data use. She has organised several successful workshops across ACM venues, including CHI.

Dr Cara Wilson is an Assistant Professor in Children and Technology at the University of Edinburgh. Her research amplifies the voices of those often overlooked in design through creative participatory methods. She co-leads the UKRI Grasping Data and Bridging Responsible AI Divides grants and has organised workshops at CHI, IDC, and PDC.

Professor Andrew Manches leads the Children and Technology group at the University of Edinburgh and co-directs the Digital Education Research Centre. He has spearheaded multiple funded projects on body-based interaction and its role in children's learning. He is the Lead for Grasping Data, a £1.2m UKRI-funded project (2025-2026) on children's data literacy and has spun out two companies to scale impact.

Dr Uta Hinrichs is a Reader in Data Visualisation at the University of Edinburgh, co-leading VisHub, an interdisciplinary research group at the Institute for Design Informatics. Her work explores engagement with data through interactive technologies and data visualisation methods.

Professor Steve Brewster is a Professor of Human-Computer Interaction at the University of Glasgow and co-chaired CHI 2019. He leads the Multimodal Interaction Group, researching multimodal HCI with a focus on audio, haptics, and gesture. He holds an ERC Advanced Grant (AR/VR) and previously an EPSRC Advanced Research Fellowship.

Dr Ge Wang is a Postdoctoral Fellow at Stanford University's Human-Centred Artificial Intelligence group. Her research focuses on Child-Computer AI interaction, algorithmic impact on families, and designing autonomy-supportive AI. She has co-organised several workshops and seminars and previously held a role at the University of Oxford.

Dr Bernd Ploderer is an Associate Professor in Human-Computer Interaction at Queensland University of Technology (QUT), focusing on health and wellbeing technologies. As an Associate Investigator at the ARC Centre of Excellence for the Digital Child, he co-designs technologies with children and parents for better sleep and active play.

Dr Andrés A. Ramírez-Duque is a Research Associate at the University of Glasgow, specialising in Child-Robot. Interaction and the design of assistive technologies for healthcare and education.

Dr Dushani Perera is a Postdoctoral Research Associate at the University of Edinburgh. A qualitative researcher, her work spans HCI, CSCW, and Social Sciences, with a focus on sustainability, information visualisation, and data physicalisation.

Dr Dorsey Kaufmann is an Assistant Professor at the University of Edinburgh, researching how visualisation enhances data literacy and influences cognition and behaviour. Her work spans co-design methods, participatory art, data humanisation, and embodied knowledge.

Professor Judith Good is a Professor in Human-Computer Interaction at the University of Amsterdam. Her research focuses on co-designing technologies for children, including those with disabilities, and developing participatory methods for marginalised populations.

Professor John Vines is Chair in Design Informatics at the University of Edinburgh and co-director of the Institute for Design Informatics. His research applies participatory design methods to novel data-enabled systems, including projects on digital outdoor play and interactive storytelling for children.

3 PRE-WORKSHOP PLANS

3.1 Workshop Structure

3.1.1 Activity One: How are we currently involving children in designs leveraging their personal data? This will work towards addressing Goal 1- to understand where and how children are being included in research and design in the IDC community, which concerns itself with their personal data. We will begin with a playful icebreaker within each group and a concise topic-focused introduction from each group member. Each activity will have an assigned notetaker. We will start by asking each participant to share the question they would most like to ask a child about their thoughts on their personal data. We will then work – either with post-its and pens (then photographed and uploaded for online access), or directly in Miro - to discuss and map out the commonalities and differences in each other's work. These will be guided by some of the core questions of this proposal, such as what agency children could have over their personal data? We will focus on the methods and approaches that participants engage with and the outcomes they are yielding. At the end of this session, each group will have created a thematic mapping based on their own work, which we will discuss together as a larger group.

3.1.2 Activity Two: What are the big issues for design here and how do we map them out? This activity will work towards addressing Goal 2; We will use the second session to tease out the 'big issues' in this space with colleagues globally – some framings we will use to probe concerns about child rights, consent, and data literacy. We will build on the smaller group maps from Activity 1 to create a 'Methods and Mindsets Map'. This will be conducted as a whole group discussion and ideation session, which we have experience in facilitating with a hybrid approach. We will strive to produce something useful for the community through this workshop. Hence, we will employ a graphic designer /artist on the day to help visualise this mapping in an accessible and digestible way, which will be subsequently polished and shared widely.

3.1.3 Activity Three: What can we do better? This will work towards addressing Goal 3. We will return to our small groups and create five key messages we want to share with the IDC community on working with children and their personal data. These will be probed by questions such as: What have we found is working, and what have we found that is not? How can we, as individual researchers, do this better? And what does design need to do better? Then, we will reconvene as a whole group and refine these into a set of key messages agreed on by all. We believe that these key principles, combined with the visual mapping, will be the foundations of a vibrant community of interest in HCI and children's personal data.

4 CALL FOR PARTICIPATION

Despite a growing public awareness of technology's accelerating capacity to capture, process and exploit personal data, this has not been matched by efforts to promote understanding of the myriad ways in which our information is harvested. Children and young people in particular are increasingly exposed to risks through their use of apparently innocuous toys and devices that can generate data from everyday interactions. What methods are being used across IDC to explore children's understanding of personal data? What steps can we as a community take to ensure children are kept safe yet have agency over their data? The goals of this workshop are:

(1) to create an explorative visual mapping of the methods and mindsets currently used by the IDC community around children and personal data, and in which contexts.
(2) To understand where and how children are being included in research and design concerning their personal data.
(3) To converge on principles or a manifesto for the design community to follow on best practice in such contexts.

This full-day workshop will be delivered in person. Potential participants are asked to submit a 2-page (excluding references, in IDC submission format) position paper to the lead author via email, addressing the following as a mini case study:

- An overview of the context currently being explored in children's personal data (age of children, context of fieldwork, e.g. schools/homes)
- Methodologies employed to explore children's understanding of personal data
- Some key examples/vignettes/images/data snippets of work being done
- Reflections on key challenges and opportunities in research around children and personal data
- One question I would like to ask participants working on this critical topic
- One question I would like to ask children about the topic of their personal data

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