Research Article

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Collaborative Speculations on Future Themes for Participatory Design in Germany

Abstract: Participatory Design means recognizing that those who will be affected by a future technology should have an active say in its creation. Yet, despite continuous interest in involving people as future users and consumers into designing novel and innovative future technology, participatory approaches in technology design remain relatively underdeveloped in the German HCI community. This article brings together the diversity of voices, domains, perspectives, approaches, and methods that collectively shape Participatory Design in Germany. In the following, we (1) outline our understanding of participatory practice and how it is different from mere user involvement; (2) reflect current issues of participatory and fair technology design within the German Participatory Design community; and (3) discuss tensions relevant to the field, that we expect to arise in the future, and which we derived from our 2021 workshop through a speculative method. We contribute an introduction and an overview of current themes and a speculative outlook on future issues of Participatory Design in Germany. It is meant to inform, provoke, inspire and, ultimately, invite participation within the wider Computer Science community.

Keywords: Participatory Design, Ethics, Special Interest Group, Collaboration: Speculative Design

1 Introduction

Participatory Design (PD) is an approach to research and design that seeks to establish agency in technology development processes for those who will ultimately be af-

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fected by the implementation of the very same technology [46].

Participation has recently become a buzzword in calls for research proposals and related announcements or initiatives. Yet, in the practice of technology development, it is still largely underrepresented or simply ignored leading to poorly designed, unfair, discriminatory, and undemocratic products with potentially disastrous consequences [10]. In order to avoid such results and to strive for socially just and democratic technology, we argue that PD must play a central role in all technology development endeavors. It is widely understood to be the only way capable of taking into account a multitude of human perspectives when creating digital artifacts that have an effect in the real world with potentially massive scales. In Germany, technology design, research and development are often engineering-driven and predominantly embedded in engineering disciplines. To date, there are only a few endeavors combining technological, ethical, legal, and social aspects through integrated participatory design [26].

Our motivation for writing this article is to create awareness amongst the German HCI (human-computer interaction) community for understanding participation as a desirable and integral part of technology development and design. We are HCI researchers and designers who organize ourselves as the special interest group "Participation" under the roof of the German Informatics Society (GI). By writing this article, we invite fellow researchers from all disciplines that find themselves working under the umbrella term of HCI to join us in contributing to more participatory practices and values of doing science, engineering, and design. We are guided by the values and perspectives of Scandinavian approaches to just and democratic PD, going beyond mere user involvement, which has been introduced to more engineering-focused HCI endeavors.

This is a collaborative article. It is collaborative in the sense that it is the product of a workshop and a writing process which has involved more than 30 people who have reflected their discussions, arguments, attitudes, experiences, and interactions. It is also a demonstration of how participatory processes of creation can work. Consequently, it must be understood as an experiment, shedding light upon three important aspects of PD as a research approach and design practice.

First, we offer a high-level account of the current state of PD – especially in Germany – which includes reflections about its origins and development, its implications for HCI as well as an account of its current state. Second, we present the results of our annual workshop on PD which can be understood as a magnifying tool, making current and future challenges for the German PD community visible. We begin with presenting relevant topics of interest as derived from analyzing past workshop position papers before turning our interest to the results of a speculative design activity which was conducted during our 2021 workshop. We conclude by putting the results of the workshop and the lessons learned into perspective, through discussing the mentioned design activity and summarizing the core insights we gained.

As such, we contribute an overview of past and present German PD activities and highlight pathways to participatory futures, through enacting and reflecting a speculative participatory design method. We argue for strengthening Participatory Design activities in Germany with the aim of going beyond mere user involvement within the engineering disciplines.

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2 Participatory Design in Germany

Involving people in research and development processes has become a common goal in many contexts. Various practices and methods of fostering participation in science, industry, design or public funding are discussed with respect to their applicability, outcome, and meaning for the people involved and their ethical and political connotations. PD is an approach which offers a variety of tools and methods to facilitate communication and collaboration between people with different professional backgrounds, capabilities and interests. Today, PD is an expanding methodological orientation within the German HCI-Community as well.

Originating from the Scandinavian movement for 'workplace democracy' in the 1970s, the Scandinavian tradition of PD follows an emancipatory agenda, which explicitly aims to integrate and empower people who are affected by a specific technology, but are often marginalized or overlooked in its development [6, 11, 16, 18]. For example, Costanza-Chock argues that people "most affected by the outcome should lead design processes," and, accordingly, "be involved throughout all stages of any tech project" [12, p. 85, 90, 98]. This presupposes openness and willingness on all sides to adopt mutual perspectives, to listen without bias, to deal with other perspectives and experiences, to endure differences of opinion, to learn from each other, to discuss solutions, to develop alternatives and to jointly implement decisions. Instead of formalized use cases or abstract requirement lists, Participatory Design processes typically involve sharing and creating stories about one's own experiences, problems, wishes, and future visions. While user-centered design approaches which are identified by Sanders and Stappers [43] as a mainly U. S.-driven phenomenon merely involve users as subjects for requirement or user-experience evaluation, the Scandinavian tradition of PD is politically motivated and strives for a democratization of technology development.

Ideally, PD opens up a 'third space' which Muller and Druin [35] define as a space for mutual learning and equal negotiations in which heterogeneous participants become co-researchers and co-designers collaborating with other experts like engineers, designers, software developers or managers on equal terms. Design in PD, hence, is a collective practice of exploring possible futures and (socio-technical) solutions. In addition, use is considered as a stage of the design process. This is relevant for the field of HCI as software and software-based products, especially, are considered to be appropriated by their users. When released, these products enter another development phase where users familiarize themselves with the technologies and suit them to their needs [44]. In this context, it is also highly important to take into account people who, as marginalized groups, are frequently overlooked or put at risk when it comes to the interaction of humans and machines in everyday and working life.

One reason for the ongoing popularity of Participatory Design is that it offers effective tools for inter- and transdisciplinary collaboration. These tools are not only used for design purposes, but also for collaboratively generating innovations of all sorts, including technical applications, business models, communication or logistic concepts. However, traditional representatives of PD have criticized that, at the turn of the century, participatory projects and practices had fallen short of the original claims to develop more socially fair technology through democratic participation of affected and overlooked social groups. Pelle Ehn and Richard John Badham observed: "While the philosophy of Participatory Design had some influence in the academic world, in the corporate and political arenas it was transformed into a form of soft technocracy, as 'user involvement' in IT design became acceptable as a software development practice." [17, p. 5]. They conclude that "looking in retrospective [sic!] what remains is more a design style, and some useful methods and techniques for ethnographically oriented Participatory Design." [17, p. 5]. Nevertheless, in current debates about designers' responsibility for global social, economic and ecological crises, such as Arturo Escobar's *Designs for the Pluriverse* [21] or Christian Nold's approach of 'practice-based ontological design' [36], Participatory Design is revived in reference to its original goals. In order to democratically create more socially and ecologically fair realities, these approaches argue for collaborative, participatory and local technology development that recognizes a deep interconnectedness between being, knowing, and doing. Still, even within Participatory Design itself 'participation' and 'participatory methods' are contested terms. Debates revolve around the questions, which modes of involvement can be called 'participation' and how open or closed a process of interaction should be to be considered 'participatory'. From an empirical point of view, 'participation' is not an unambiguous state, but rather unfolds as a landscape of various terrains, as Sanders and Stappers have prominently described it [43]. Participation, thus, is a spectrum of modes of involvement. In this context, PD is not a 'magic bullet' which cures all pitfalls of traditional research and design approaches, but a spectrum of possibilities for fostering democratic development processes.

How is this development reflected in the German HCI community? Looking at a steady stream of strong publi-

cations at the annual ACM SIGCHI conference,[1] German HCI is thriving. However, in all 207 publications from the German HCI community at CHI 2020 and 2021 the keyword 'Participatory Design' is mentioned only once (for an overview see: https://www.germanhci.de). Since its inception, the i-com journal counts one special issue on cultural probes as Participatory Design practice [31] and a forthcoming special issue on living labs as 'third spaces' for mutual learning [5]. Looking more closely into existing design practices as a subject of discussion at the premier German HCI conference "Mensch und Computer" (Human and Computer, MuC), user involvement mainly refers to user-centered design. Yet, participation is not only to be considered as a method but above all a basic attitude that goes hand in hand with a critical reflection on and a change of one's own research and design activities, values, assumptions and power relations anchored therein. The objective of the Special Interest Group on Participatory Design of the German Informatics Society (henceforth FG PD), as one of the central bodies of the community, is, therefore, to practically revitalize the original goals of Participatory Design in the German HCI community. A further goal is to develop and critically reflect on the approach with regard to emerging technologies such as AI, that raise new challenges concerning socially responsible design. This involves considering *participatory* technology development as a necessary component of an open, diverse and democratic society.

Within the German PD community, participation is translated into practice in various different forms. The community is united by a set of questions with which to build a framework for implementing participation in the sense of Scandinavian PD regarding various research and development projects:

– How do power relations and interest relationships manifest themselves in technology development processes? Who designs for whom? Who is involved, who decides, who benefits? Who is disadvantaged or excluded?
– What assumptions exist about users and the field of application? Where does the knowledge about them come from? Are gender and diversity aspects taken into account and, if so, how? How does one avoid stereotypical assumptions? How does one avoid discrimination or unconscious exclusion?

– How does one develop technology together with participants who have got very different knowledge bases, competencies, interests, attitudes or communication preferences? How can different ethical ideas be negotiated productively?
– What methods and techniques are available for equal cooperation between directly and indirectly affected participants and an interdisciplinary team of researchers/developers/designers?

These questions have consequences for the diverging topography of the methodological landscape of PD in Germany. The complexity of this local landscape of PD demands a close look at the concrete socio-material practices of participation [4]. In order to showcase and discuss the diverse landscape of actual PD practices in Germany today, the following sections will provide detailed insights. The annual workshop on socially-fair technology development, in the framework of the "Mensch und Computer" (MuC) conference organized by the German Informatics Society (GI), provides a space in which German PD practitioners within the HCI community negotiate their shared understanding of the concept of participation. In addition, the workshop serves as an exchange platform for concrete projects and practices. This year (2021), we used the workshop to assess the current state of Participatory Design practices and to participatively speculate about the future of PD in Germany with a heterogenous group of researchers who, while coming from various different fields, share an interest in participation in the context of HCI.

3 Current Contexts, Topics, and Methods in Participatory Design in Germany

In the previous section, we outlined the origins of PD and how it shaped the German PD community. With this section, we shift our attention from the past to the present before we continue with visions for the future in the subsequent section.

In preparation for the mentioned workshop, we conducted an analysis of current topics in PD research and practice in Germany. The analysis was based on the contributions to our workshop which had been submitted over the past three years. We looked for emerging patterns and derived several topic areas based on the frequency with which certain topics appeared and their relevance concerning the shaping of current and future technologies.

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1 ACM SIGCHI is the leading international community of professionals interested in research, education and the practical application of human-computer interaction. More information is accessible at: https://sigchi.org/about/about-sigchi/ [26.01.2022].

The topic areas were then labeled and summarized within descriptive accounts. Subsequently, we present the topics in German PD which currently concern our community the most in a non-hierarchical order:

Data and AI: A current topic in many submissions is the design, use, and evaluation of human-computer interactions concerning AI systems that, in general, "seek to make computers do the sorts of things that minds can do" [7, p. 1]; and, more specifically, data-driven algorithms (e. g., machine learning or deep learning). While this is a current topic in many areas around computer science, the specific focus of Participatory Design in this area becomes clear in the questions being asked in relation to the social impact of AI and data projects. Increasingly, the role of stakeholders and data subjects is inquired (e. g. [14, 47]). Critics emphasize that "undersampled majorities" are insufficiently represented in research results and design (e. g. [38]), and training data insufficiently capture the context in which AI solutions are applied (e. g. [3, 13]). As minorities and vulnerable demographic groups are often excluded from both the societal discourse about AI and the development of AI solutions, they find themselves time and again in a position where the technology and its use breaches their fundamental rights and accelerates injustice and inequality. Ethical frameworks have long been heralded as a way for promoting ethical consideration of data science and AI. While most guidelines to ethics in AI and data projects provide merely a framework for considering core values, others, such as the Data Ethics Decision Aid (DEDA) are deliberately geared towards dialogic, inclusive, and participatory deliberation [24]. Using deliberative processes for involving stakeholders actively into deliberation on AI and data projects and supporting them in making informed decisions constitutes participatory data ethics [45]. Further urgent questions relate to participation and power: Who can be involved in decision-making processes, at what point (e. g., data, algorithm, interface, over time) and how [2, 32]? Or, regarding explainable AI, how can end-users be involved in the development and visualization of explainable AI systems [34]? And most importantly, how can stakeholders and authorities (e. g. safety and regulation authorities) inquire into the socio-technical qualities and effects of algorithmic systems (e. g. [41]?

Aging society: Demographic change and the digital transformation are two major trends in today's Western societies. The proportion of people aged 65 and older is steadily increasing in all industrialized countries, due to an increase in life expectancy as well as a decline in birthrate [48, 37]. To meet the needs of this growing part of the population, new technologies emerge at a fast pace [39]. In the related discourse and concrete design practice, technologies are predominantly understood and envisaged as a solution to the 'problem' of demographic aging. Aging is understood as a purely biological process of decay and older adults as frail and needy [49]. In doing so, technology design frames age and aging as problems that need to be solved through technologies which must be accepted by older adults for their own good. In contrast, Participatory Design takes a different starting point and regards older adults as resourceful and knowledgeable individuals that can contribute to design processes with their vast knowledge and lived experience. It considers which digital aging futures we want and how technological innovation configures older users in specific ways [4, 20]. However, technological innovations are often driven by technical feasibility and not by the needs of its end-users – in this case older adults. Participatory Design argues that it is essential to include older adults as active agents into the process of innovation and development of technologies [42]. This is precisely the starting point of current Participatory Design projects. For example, Fleck and Marsden [23] actively involved older adults in the development of communication tools that were particularly needed in times of personal isolation during the COVID-19 pandemic, and Jarke [30] describes how older adults co-created digital public services based on open government data.

Lessons from the pandemic: The COVID-19 pandemic presented challenges for many scientific fields, yet Participatory Design practitioners and researchers were hit especially hard when they were forced to either find ways to run workshops remotely or sit and wait for the pandemic to subside. Many PD projects experimented with turning face-to-face workshops into virtual formats supported by tools for online collaboration [23, 33, 50]. Despite managing to conduct several co-design sessions, many projects are left with the question whether 'video call co-design' could ever be a viable substitute for Participatory Design meetings. Looking at remote Participatory Design, Mucha [34] asks whether we reach more people or more of the same people, and less of the people that would matter. Further considering the burden the pandemic has put on everybody, he puts the question up for discussion: Are we stealing people's time or are they really able to profit?

Empathy Building: One current topic that is touched upon in many submissions is (building) empathy either in the design process (e. g. [23, 27, 33, 40]) or by using technology to build empathy (e. g. [29]). This is not very surprising as (i) the conviction that future users are the real experts of their lives and (ii) building empathy with their lived experiences is at the core of Participatory Design. When transferred into real life, this conviction is of-

ten difficult to communicate to other stakeholders. For example, in one current Participatory Design project developers were only able to really empathize with future users (older adults) and start to take their experiences seriously when being directly confronted with them in interview sessions [42]. Other submissions focus on (participatory) design of tools that aim to build empathy with and take the perspective of future users, such as people with psychiatric diagnoses [29].

Participation for All ...? (Diversity)/What does participation mean?: Projects that are labeled as Participatory Design projects comprise a wide range of levels of involvement and differ with regard to their notion of democracy, which relates to the explicit inclusion of affected social groups, including marginalized or even completely neglected ones (e. g., [1, 40]). Consequently, the quality of participation with regard to the involved stakeholders and their influence on the process of decision-making can differ considerably. Participatory Design as a methodology does not follow a strict procedure. Instead, it is based on core principles that guide the practical realization of PD projects, addressing the equal distribution of power between the stakeholders who are invited to speak for themselves and express their, sometimes even conflicting, attitudes, opinions, ideas and visions (e. g. [8, 9]). 'Agonistic struggles' are even desired and seen as an expression of a vivid democracy as defined by political scientist Chantal Mouffe and cited by Björgvinsson's et al. [6] as a part of PD in the sense of an approach for "democratizing innovation". Another cornerstone Muller and Druin [35] defined is their PD as 'Third Space' concept which means to achieve a shared ownership of the results of a design process in which participants become co-designers. In order to make sure that PD projects take the democratic mandate of these conceptualizations seriously, the blackbox of participation must be unpacked. This includes asking the participants themselves whether they feel equally included as co-investigators and co-designers.

4 Method: From The Archives of the Future

The main contribution of this collaborative paper is to provide insights into Participatory Design and take account of the current state of this line of research, in particular, focussing on the German PD community. By doing so, we want to raise awareness of the necessity to include those who are affected by technology in its development pro-

cess. However, our objective is not to provide a traditional literature review as there are plenty [46, 8, 28]. Instead, at the core of this article, we, as a community, speculate about desirable futures for our practice. By doing so, we strive to uncover challenges and opportunities along the way. Participatory Design advocates direct action and profound reflection. By collaboratively writing this article, we explored techniques for participatory research and writing processes.

The approach which forms the basis of this paper is speculative design. Speculative design explores the implications of new developments in science and technology through crafting speculative design artifacts and concepts, often as a catalyst for critical thinking and discussion [15]. Our method of choice in this regard is the Future Archive Method [25]. It is a method that seeks to imagine a desirable future and articulate it by producing speculative documents. By writing these documents – in our case abstracts for speculative research papers – we remember the present from an imagined future as if it were the past. Thus, we create distance for reflection while at the same time precisely formulating our observations. The method is easy to use and encourages critical, yet constructive, thinking. By articulating how we want things to be, we become more aware of the things we are doing and the goals that we are pursuing here and now. The method can be conducted individually as well as in group work, and as a speculative writing method using cloud-based tools, it works very well in remote settings and under pandemic circumstances.

We ran the Future Archive Method[2] as a remote group activity during the aforementioned workshop and afterwards invited more PD researchers to contribute further abstracts following the same procedure. During the workshop, we used Zoom breakout rooms and a shared Google Slide deck with dedicated slides for all groups. Thus, we could all work in one document, keeping track of the progress and simplify the remote presentation of the results.

Twenty-One researchers participated in the workshop. We met online for four hours on September 6th, 2021. First, this year's submissions to our workshop were presented in short talks (3 minutes each). After that, we ran the group activity in which speculative abstracts were produced geared towards the topic areas described previously. The allocated time for writing the 200 word pieces was 60 minutes. Finally, these abstracts were presented

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2 We would also like to give credit to the organizers of the HCXAI workshop [19] at CHI 2021 for introducing the method to us.

and discussed. The scenario and the task given to the participants were the following:

The Scenario: Each year in fall, it is deadline time. Imagine you are in the year 2024 and abstracts for the Participatory Design Conference 2025 are due. You have been working hard since you presented your projects at the Participatory Design workshop at the Mensch und Computer conference 2021, with your research in its early stages. You made valuable connections there with fellow researchers, some of you even became friends. Now it is time to shine and publish your results. Together with your co-authors you look back at your work. As is our approach, you are critical and constructive, thinking about how your work helped moving the field forward overcoming obstacles and criticism from within and the outside.

The Task: Your task is to come up with a title and write an abstract (200 words max) for a research paper that you would write in the future. In this paper you present the Participatory Design work that you are doing now and that you will have finished by then. As a stimulus for your creativity we provide nascent topic areas and a provocation for each of the topics. In your speculative paper you may respond to the provocation and use it as guidance for your arguments.

As laid out before, the topic areas mentioned in the task description, were extracted from the position papers submitted to the workshops. Each topic came with a provocation, which the organizers of the workshop had written based on the submitted position papers, to stimulate creative and critical thinking. For example, the provocation for the 'Data & AI' topic read: "Participation is just a cheap cover up to hide behind while optimizing for machine logic and reasoning because ultimately it is too complex for anyone to understand".

5 Results: The PD Archive of the Future

The speculative activity produced twelve abstracts which are characterized by a diversity of perspectives and approaches towards PD. While reading, keep in mind that the abstracts are speculations, this means that the solutions they propose are desirable in the future but the problems they build on are relevant today.

Abstracts 1 to 3 are about artificially intelligent systems that can only work by using large amounts of data. The abstracts explore why they are a concern for the PD community and how PD can be used as an approach to the design of these systems. Abstract 1 raises the question who is accountable and emphasizes that "the com-

plexity of data and AI systems must not be used as an argument against checks & balances and civic participation in the deliberative processes". The authors come to the conclusion "that democratic societies already have developed processes and institutions that can effectively participate in making AI accountable and enforcing public oversight." Abstract 2 points towards the necessity of AI systems to provide meaningful explanations for their behavior and that currently "explanations are predominantly implemented after the fact." Concerning this matter, the authors problematize "techno-centric engineering processes and development teams that lack diversity and empathy." Abstract 3 speculates about how to explore the human-material configuration of ML decision support in medical contexts. If such systems are to be understood as partners in critical decision making contexts, how must such partners act? The abstract configures decision support entities in three ways: "as moral authority, a system as a critical reflection board, and a system that provides a discourse-analytical perspective."

Abstract 4 invites us to reconsider old age and aging in technology design and de-script the category of '(old) age' in the context of technology development. The authors speculate about a living lab setup in which developers and elderly people come together as experts on an equal footing. "Older adults, as experts of their lived experiences, contributed knowledge about aging in relation to specific social contexts and tech experts contributed their expertise on technology development."

Abstracts 5 and 6 speak about what it means to be a PD researcher during the COVID-19 pandemic. Abstract 5 turns its attention to a socially distanced, digitally connected world and the manifestations of so-called bubbles. The authors argue for making bubbles productive as "spaces of experience and skills". Abstract 6 extrapolates further by observing that "it became clear that people with learning disabilities suffer from the digital divide so that the usability of digital technologies became more relevant for this group of people". In contrast to abstract 5, abstract 6 focuses on the need to overcome our own bubbles as this can "influence the quality of digital innovations and reduce barriers that inhibit usability and lead to social exclusion."

Empathy building is the underlying theme of abstracts 7 and 8. Abstract 7 envisions the concept of "Empathy by Design". The authors illustrate how they would have developed and tested a compulsory empathy course for first year computer science students to build and foster empathy towards marginalized people. The goal of the project described in the abstract is to understand the impact of "having empathy" on future technology design-

ers. Abstract 8 encounters the issue of empathy building in reference to local engagement. The authors describe a so-called "Reparierbar" (repair bar) which would merge and exploit benefits from the concepts of living labs and repair cafés consciously situated in rural areas. At its heart would be "un-black-boxing" which provides an approach to deal with "an increasingly complex but also increasingly important technological world".

Abstracts 9 to 12 speculate more broadly about participation and what it actually means to design and develop technology in a participatory manner. Abstract 9 picks up the topic of designing for people with learning disabilities and develops a project that investigates how to promote participation by this group and which challenges arise from the use of a participatory approach. Abstract 10 contributes to the PD method discourse by proposing an "exclusively conversational participatory workshop for the generation of potential chatbot personas". Abstract 11 encourages a switch in perspectives when reporting on PD activities and proposes a reflexive study that "deals with the participation experience of participants". The authors argue that through such an approach valuable insights, for example, about participants' motivations could be gained. Finally, abstract 12 focuses on the role of researchers and practitioners and speculates about a "mental well-being intervention programme for researchers engaged in Participatory Design" to cope with obstacles such as ethical concerns or a "sense of unfulfillment when designs are not implemented".

If you wish to read the full abstracts, please refer to the appendix of this paper.

6 Lessons Learned from Speculating About PD

Participatory Design goes beyond user-centered design insofar as it actively includes and gives a voice to all people affected by technology. Our archive from the future shows that events like the COVID-19 pandemic, social shifts such as an aging or more inclusive society, and new technologies, for example, AI systems, provide new possibilities and challenges for how to design with a participatory mindset. Confronted with these conditions, we used this collaborative paper to explore new methods, domains, and approaches to put the original objectives of Participatory Design into practice. Below, we summarize and discuss what we have learned from the topic areas and abstracts as well as their implications for the future of PD in Germany and beyond:

A Need for Better Evaluations of the Impact of PD Practices in Real World Settings

We see a desire to gauge the impact that Participatory Design actually has on technology development in the real world. The latter is expressed by two recurring patterns. The first one is the wish for long-term scientific engagement, monitoring, and evaluation. This is a discussion that has been around for a long time. There is an apparent gap between the long-term nature of participatory processes of engagement and negotiation and the short-term nature of publicly funded research projects. One way to initiate change is to convince policy makers with the power of numbers which can be provided through evaluatory techniques. Hence, the second pattern is thinking about tools and scales to measure the impact of Participatory Design activities. We see this in initiatives running Participatory Design workshops and evaluating the results in large-scale empirical studies as imagined in Abstract 2 and 7 that envision evaluations of "empathy sprints" with undergrads. We also witness the desire for real-world impact in approaches that combine methodological and practical institutionalizations of Participatory Design work in living labs and repair cafés as in Abstract 4 which proposes mutual learning between designers and older adults through an exchange of expertise and lived experiences in a three-year living lab.

A Need for More Suitable Approaches for Entangling Complex Socio-Technical System Settings

When designing technology we are faced with complex socio-technical systems. This is not only due to technical complexity but also caused by the complex nature of human–machine, human–human, human–non-human interactions, and/or any combinations thereof. The latter is illustrated in abstract 3 that explores the impact of different entities in medical decision-making scenarios. Moreover, we see approaches that account for complexity when thinking about marginalized participants as intersections like gender, age and disability come into play (e. g. abstract 4 and 9). The question is how we might institutionalize Participatory Design and make participation an integral and mandatory part of technology development, especially in complex environments such as expert domains, diverse and changing social realities, such as an aging society, or groups at risk of exclusion, or when dealing with sophisticated or black-boxed technology such as machine learning. One example from the abstracts would be to "un-black-box" complex systems by helping participants to gain knowledge on how to fix technology through long term participation in a repair café

(abstract 8). In addition, the abstracts point towards a need to build on what we already have (such as democratic institutions and governance structures that support checks and balances, regulation, and enforcement, see abstract 1) and what we are good at with regards to Participatory Design methodologies, yet constantly improving the methods used through, for example, design workshops in which participants learn about chatbots by having to communicate with each other through conversational interfaces (abstract 10) and making these methods fit for a variety of real-world applications.

A Need for Constantly Assessing the Tools We Use for Research and Practice of PD

Fueled by the COVID-19 pandemic, methods for conducting (persisting) remote Participatory Design and questions of power have (again) become a pressing concern. A central question is if the technology we are designing is equally well suited to help us do design work in the first place. In other words, we need to discuss and find a balance for putting to use the advantages of remote work – potentially reaching more people – and the deeply human need for face-to-face exchange as emphasized in abstract 5. Likewise, we need to be critical of the unintended and unwanted effects of remote work, e. g., clickworker exploitation and screen-time induced fatigue. We also need to be mindful of the audiences which remote participatory work can reach and whether remote PD can adequately address and do justice to diverse needs such as learning difficulties (abstract 6). One way to ascertain that participatory efforts have an actual impact in future projects was imagined in abstract 11 which proposes turning to participants to evaluate the degree of participation in Participatory Design projects.

A Need for a Better Understanding of the Role of PD Between Research & Activism

Finally, we use this opportunity to stress one of the remarks made during the workshop and in abstract 12, which is the need for self-assessment among Participatory Design researchers concerning their own well-being. Participatory Design has a habit of oscillating between research and activism – which we very much appreciate – but which also demands a lot from those deeply engaged with it. Collaborative community activities such as speculating about desired futures or writing this article help us to acknowledge the state of things and chart the course for future Participatory Design endeavors. At this point, our aim is to encourage others to try it out for themselves!

7 Conclusion

In this participatory paper, we assessed past, present, and future topics relevant to the German Participatory Design community and presented a "PD Archive from the future" consisting of twelve heterogeneous speculative abstracts that imagine how PD might take on issues like AI, an aging society, pandemic consequences, building empathy, participation for all and what participation even means. Our abstracts are a gateway to illustrate where we want to go next in order to make PD an integral part of HCI research and development. We call on everyone who has been inspired by our collaborative writing approach or our speculative abstracts, as well as anyone who has an idea for new methods or for how to overcome one of the unsolved issues identified above and for all people seeing themselves somewhere on the Participatory Design spectrum to take action, to get involved in the community and to help us build a future worth living in.

Appendix. Future Archive Abstracts

Topic Area: Data and AI

Provocation. Participation is just a cheap cover up to hide behind while optimizing for machine logic and reasoning because ultimately it is too complex for anyone to understand.

Abstract 1 – Accountable AI for the Open Societies

Authors. Anna-Katharina Dhungel (University of Luebeck), Mirko Tobias Schäfer (Utrecht University), and Wilhelm Weinhold (University of Wuerzburg)

Author Keywords. Accountable AI, Civic Participation, Governance, Public Oversight

Abstract. The complexity of data and AI systems must not be used as an argument against checks & balances, and civic participation in the deliberative processes. There are already structures in place to support checks & balances for responsible data practices and accountable AI. This paper identifies different groups of participants and their diverse agency in engaging with deliberation processes.

We distinguish different levels of participation: general participants (e. g. voters), experts (data scientists or practitioners), representatives and elected/appointed officials as well as authorities (safety and regu-

lation authorities, and other government organizations, which can audit companies and algorithms). In addition, this paper proposes a number of processes that facilitate and support accountability for algorithms:

– public inventory of algorithms and AI systems
– appeal processes (infrastructure for complaints, appeals, revisions)
– general data literacy for representatives
– media as fourth estate and channel for whistle-blowers
– regulations for interoperability, data sovereignty
– ethics committees, value-sensitive design

We argue that democratic societies already have developed processes and institutions that can effectively participate in making AI accountable and enforcing public oversight. On a geopolitical dimension this model of accountable AI is different from the libertarian approach in the US and the government top-down model of China, which we will shortly discuss in the outlook.

Abstract 2 – Empathy Sprints as a Means of Institutionalizing Participation in Human-AI Interaction Design and Development

Author. Henrik Mucha (Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB)

Author Keywords. Human-AI Interaction, HCXAI, Participation

Abstract. Providing explanations for machine behavior in a way that is understandable to those affected by intelligent systems is a key feature and non negotiable. Yet, explanations are predominantly implemented after the fact. The poor outcomes are the result of techno-centric engineering processes and development teams that lack diversity and empathy. In this paper, we argue for implementing empathy sprints as a mandatory tool for stakeholder exchange in Human-AI interaction design and development. We outline how we facilitated trans-disciplinary design workshops with 200 undergrad students from twelve different countries and from the departments of medicine, design, engineering, psychology, sociology, and computer science. We demonstrate how 25 design teams designed speculative yet very near future decision support systems (DSS) based on a real-world medical use case scenario with real patients as collaborators during the workshops. We provide insight into the working mechanism of organizing Participatory Design work and how to synchronize such activities with existing technology development

processes. We conclude by presenting a comparative user study (n = 1248) measuring the effectiveness using weight of advice metric (WOA) of the results showing that they perform significantly better than the traditionally developed baseline explanation interface. Finally, we discussed these results in an interview study with 12 practitioners (8 medical doctors, 4 executives).

Abstract 3 – Making the Invisible Visible: Exploring the Human-Material Configurations in Narrative-Based Decision Making

Authors. Claudia Müller-Birn, Peter Sörries, Susanne Michl, Christoph Benzmüller

Author Keywords. Human-AI Interaction, Participation, Narrative-Based Medicine

Abstract. Research has shown that the accuracy of machine learning (ML) systems defeats experts' expertise in medical contexts. Physicians increasingly employ ML systems to diagnose diseases more efficiently or personalize treatments more effectively. This shift of focus on ML-based decision making has pushed back the formerly widely used approach of narrative-based medicine, where people's narratives are used in clinical decision-making. The decision-making regarding life-prolonging measures, for example, represents very "dense" moments in which clinical data from the medical history, prognostic assessments (e. g., heart rate, medication), uncertainties about the patient's presumed will and values, but also information about their social environment are collected. In many cases, narratives, emotions, projections and values on the treatment team or family members play a role as well.

A challenge in this field is the inclusion of ML systems. Research now agrees that the goal is not to replace decision boards with an ML-based system, but rather to conceive ML-based systems as a 'partner' that partakes in the decision-making process in a responsible and ethical way.

By building on the Participatory Design concept of Speculative Enactments, we developed three configurations: a system as moral authority, a system as critical reflection board, and a system that provides a discourse-analytical perspective. Each configuration represents a possible setup of an ML-based system realized by a Wizard-of-Oz approach. Nonetheless, we not only carefully designed the envisioned system but also the human-material configurations in each setup. By doing so, we wanted to understand how material con-

figurations affect decision-making processes. We conducted six workshops in the context of life-prolonging decision-making including people from the medical health care area. The results show how our participants reacted quite differently in each configuration. We employed a Situational Analysis and discerned which entities (e. g., human, non-human, social, material) are relevant to (or influence) a situation, and how these entities relate. We were able to derive concrete design recommendations for using ML systems in narrative-based medicine.

Topic Area: Aging Society

Provocation. As today more and more elderly people are familiar with digital technologies, the category 'age' has to be reconsidered and many projects for Participatory Design explicitly aiming at elderly people become obsolete.

Abstract 4 – Participatory Design: Coming of Age by Leaving Age Behind

Authors. Marc-Julian Fleck, Juliane Jarke, Nicola Marsden, Katja Antonia Rießenberger, Torben Volkmann

Author Keywords. Participatory Design, Age(ing), Gerontechnology, Age-Scripting/Descripting of Age

Abstract. Old age and aging have been re-considered in technology design. It is no longer merely understood as a bodily process of decay that needs a technological fix, but rather as a social and material process that makes the dichotomy of older adults (as "opposed" to younger adults) obsolete. In technology design we consider the heterogeneity of older adults, including intersectional aspects such as gender, education, financial situation, and social inclusion. In a three-year living lab setting we have developed interventions to descript the category "(old) age" in the context of technology development. In an iterative series of provocations and reflections we were able to change the perception and the approaches of designers and of older adults. Design was understood to include technology use and creative adoption. Designers were not just those having a formal education, but all those tinkering, experimenting, appropriating, and creating technologies. In a Participatory Design process, mutual learning between participants took place with each of the participants contributing their expertise and lived experience. Older adults, as experts of their lived experiences, contributed knowledge about aging in relation to specific social contexts and tech experts contributed their expertise on technology development. The process of provocations and reflections we used in the Participatory Design of Gerontechnology succeeded at enabling designers to learn about the reality of aging and fostering a de-scripting of the category of "(old) age". Our interventions further develop Participatory Design to make decision-making processes transparent and represent a diversity of voices.

Topic Area: Lesson Learned from the Pandemic

Provocation. As the pandemic taught everybody how to connect online, we can design from everywhere together with the ones who are affected … but in fact we actually stay in our bubbles.

Abstract 5 – Self-Confident Participation in Design: Connecting Bubbles, Sharing Skills

Authors. Anne Weibert, Monika Pröbster, Julia Stilke

Author Keywords. Participatory Design, Digital Divide, Diversity, Remote Design

Abstract. As the pandemic has forced everybody to learn how to connect online, we got to know what it means to design from everywhere together with the ones who are affected. We have learned that to connect online is not just a matter of skill, but, much more fundamentally, a matter of access, equipment and connection. We became aware of the limitations of communication in the digital sphere. Designing together needs a shared language and phases of direct hands-on interaction. Online as well as offline, we frequently stay in our bubbles. We knew before how hard it is to overcome bubble-borders and to establish trustful relations, which form the basis for self-confident participation. We have learned the hard way that this is no different in the digital sphere. We emphasize the need to also recognize bubbles as spaces of experiences and skills which can be combined to create something new.

Abstract 6 – Overcoming Bubble Borders to Increase Digital Inclusion

Authors. Stefanie Klein (KatHo NRW), Isabel Zorn (TH Köln) (isabel.zorn@th-koeln.de)

Author Keywords. Participatory Design, Digital Divide, People with Learning Difficulties

Abstract. As the pandemic forced services for disabled people to improve their digital infrastructure, Participatory Design with people with learning disabilities became more likely. Professionals who work in these services have to extend their technical skills to provide possibilities for digital participation of their target group. It became clear that people with learning disabilities suffer from the digital divide so that the usability of digital technologies became more relevant for this group of people. However there is still a lack of connection between the welfare system and the systems research and development that leads to a great gap between the need of digital participation and the actual amount of Participatory Design projects with this special target group. The study leads to the assumption that thinking and working outside of the own bubble can influence the quality of digital innovations and reduce barriers that inhibit usability and lead to social exclusion.

Topic Area: Empathy Building

Provocation. Real empathy is nothing that can be provoked with the help of technological devices. Our own experiences are limited to our own being. In the end, empathy building, as a goal of Participatory Design, is just an empty promise.

Abstract 7 – "Empathy by Design" Compulsory Empathy Workshops for Undergrad Computer Science Students: A Large Scale Analysis of 1000 Student Projects

Authors. Alexandra de Carvalho, Arne Berger, Franzisca Maas, Sara Wolf

Author Keywords. Longitudinal Study, Education, Empathy Building

Abstract. Empathy is the ability to take perspective. A number of tools exist that help to elucidate the lived experiences of "others". Simulation tools such as age suits, for example, can help to live experiences that can not be explained. Other tools focus on first person encounters such as designers working in care homes or doing co-design with blind people. To understand the impact of "having empathy" on future technology designers, we developed and tested a compulsory empathy course for first year computer science students to build and foster empathy with marginalized people. We report on the first four iterations of this course with a total of 1000 first semester computer science students. With 250 CS students enrolling every fall semester, CS students had to choose eight modules for empathy building from a corpus of tools and methods we curated. Among these were both technology mediated and non-technological methods, such as talking to a person who experiences schizophrenia or living in a nursing home over a four-week period. We used a between-subjects design to compare tools designed by students who took part in our course to CS students that had earned their degree in the previous semester. Our findings suggest that tools developed by students who took part in our course were perceived to fit better into the lives of those affected. The tools developed by students who took part in our workshop differed substantially from tools developed by students who did not take part in this course: They are longer in use, have been repaired more often, and users report these tools to better reflect their lived experiences and individual perspectives.

Abstract 8 – Reparier Bar: A Long Term Assessment of a Self Sustained Living Lab Repair Café in a Rural Area in Germany

Authors. Albrecht Kurze, Arne Berger, Andreas Bischof

Author Keywords. Participatory Design, Digital Divide, Technology Literary

Abstract. We conducted a long term study, combining a living lab approach with a repair café. The "Reparier Bar" enabled positive synergies between both formats. The living lab approach ensured a systematic and research-driven participation, while the repair café approach revealed actual practices of gaining and sharing deepened technology literacy. We found "un-black-boxing" as a practice to an increasingly complex but also increasingly important technological world: Participants often gained strong technical knowledge and a deeper understanding of how things work by repairing them: analyzing what is broken, finding out how to fix it, fixing it, and then to share knowledge about successful or failed repairs in a community of like-minded. Besides curiosity and interest in technology we also found environmental awareness and a desire for sustainability, to extend a product's life, as key drivers for participation. Many of our participants were older adults, still used to fixing things as they did in their youth. They meaningfully and continuously engaged with digital natives, who, until then, were only used to consume goods with a short life-span, such as mobile phones with batteries soldered in. We found old

skills (screwing, soldering) meeting new skills (programming, firmware patching); the later increasingly important for prolonging life of digital devices. Lastly, being situated in a rural area, our space not only served the functional purpose of repairing things, but also the social purpose of social connection, new friendships and solidarity, within a sparsely populated rural area, lacking some of the offerings of urban environments.

Topic Area: Participation for All ...? (Diversity)/ What Does Participation Mean?

Provocations. Everyone can participate in Participatory Design – if they can easily be reached and have at least some specific skills: reading, understanding, joining new contexts!" What about those who do not fulfill these requirements?

Participation is a great headline. Participation is a good thing to boast about. If you ask five different people what they mean by participation, you get five different answers. But what does participation actually mean?

Abstract 9 – Challenges and Approaches for Participatory Design with People with Learning Difficulties

Authors. Stefanie Klein (KatHo NRW), Isabel Zorn (TH Köln) (isabel.zorn@th-koeln.de)

Author Keywords. Participatory Design, Digital Divide, Diversity, Exclusion, Superficial Participation

Abstract. The study analyzes the possibilities and approaches of participation of people with learning difficulties in participatory technology development projects from the perspective of social work. It therefore does not deal with the technical implementation or the design, but focuses on the participation and empowerment of the target group. It therefore also focuses on the respect for diversity, as well as the structures in which the research and the target group move. The research questions that form the basis of the work are therefore: a) What are the challenges for the participation of people with learning disabilities in participatory technology development? b) Which approaches are suitable for promoting the participation of people with learning difficulties in participatory technology development? Related work: Results and methods from other studies will be presented. Method: In a qualitative study 6 expert interviews were conducted with developers, researchers and educational staff involved in participatory technology development with people with learning disabilities. Findings: Methods used, challenges discovered are described in categories: Benefits, risks, structural barriers, challenges, setting design, methods, role of caregivers, degrees of participation.

Abstract 10 – Synchronizing Required Skills for Technology Use and Workshop Participation: An Exclusively Conversational Participatory Design Workshop for Chatbot Persona Design

Authors. Diane Linke, Peter Sörries, Claudia Müller-Birn

Author Keywords. Conversational User Interfaces (CUI), Participatory Design (PD)

Abstract. By using human language as an (intermediate) user interface, textual conversational user interfaces (CUI) require only a few skills from their users, namely reading and writing. Yet, workshops aiming at Participatory Design of CUI elements focus on physical and visual interaction by workshop participants with each other and with physical design objects.To tackle this challenge, we introduce an exclusively conversational participatory workshop for the generation of potential chatbot personas. In this workshop, all interactions between workshop participants are limited by the written conversational user interface. The workshop consists of four phases in which (1) workshop participants learn about the scope of a fictitious chatbot, (2) name possible features of this chatbot, (3) have a guided conversation in a Wizard-of-Oz setting mimicking a chatbot with the mentioned features, and (4) finally evaluate the conversation with the represented chatbot.In a user study applying the exclusively conversational workshop format, we found that participants who were paired with chatbots similar to their named properties experienced them to be more useful than others. The workshop also provided realistic examples of perceived traits through language and training data for dialogs modeled in the domain.

Abstract 11 – Subjective Experience of Participants

Authors. Caroline Kortekaas (TH Köln)

Author Keywords. Participatory, Barriers

Abstract. When people are involved in the design and development of technologies, digital technologies are created that meet people's needs, are used in their everyday lives, and serve their purpose. What exactly does

this participation mean? Reports on participatory technology development are usually done from the perspective of the implementing entities. There are a multitude of project descriptions, reports and methods instructions or reports about challenges of participatory development – these are predominantly the views of those who enable participation. For this reason, this study deals with the participation experience of participants. An initial survey of young participants in a technology development project shows that there is no awareness of what the young people can actually participate in. They perceive it much more as a school setting, as an opportunity to learn something about technology. They participate in order to have a change from everyday life, to improve media and language skills. Research questions: How do participants themselves experience participation in participatory technology development? Methods: In a qualitative study five youth of a stationary youth welfare institution, who took part in a participatory technology development project, were interviewed about their experiences. Findings: motivation, expectations, role of care givers, methods, challenges and barriers, effects.

Abstract 12 – Designing a Mental Wellbeing Intervention Programme for Researchers Engaged in Participatory Design in Industrial Shopfloors

Authors. Ana Correia de Barros, Elsa Oliveira, Ricardo Melo

Author Keywords. Participatory Design, Mental Health, Wellbeing, Reflexivity, Design Intervention

Abstract. Participatory Design has been at the service of digital transformation of industrial work for decades. However, a significant number of researchers engaged in such kind of research face mental issues due to challenges of Participatory Design on the shopfloor. Examples are ethical issues emerging from worker-researcher-employer dynamics, possible coercion of workers, lack of conditions for workers to participate in Participatory Design activities, confidentiality issues, limitations to researchers' presence on the shopfloor and sense of unfulfillment when designs are not implemented. We report and reflect on the design of an intervention programme to improve wellbeing among researchers facing such mental wellbeing issues. We recruited 20 Participatory Design researchers with prior work on industrial shopfloors and we used individual interviews, group exercises of reflective practice, and co-design workshops. Content analysis of the data suggests that Participatory Design researchers themselves were sometimes reluctant to expose themselves and their work practices, which limits our understanding of the phenomenon. Drop-out rate was high and with significant challenges in bringing together participants for group activities due to conflicting calendars and a lockdown. The co-designed programme was not fully implemented because there were not enough resources to address all unmet needs identified in the research process.

References

[1]   Ahmadi, Michael, Herling, Claudia, Wulf, Volker, & Marsden, Nicola. (2020). *Living Labs als feministische Forschungsinfrastrukturen: Lessons Learned eines dreijährigen Gender Projekts*. https://doi.org/10.18420/MUC2020-WS109-246.

[2]   Benjamin, Jesse Josua, Kinkeldey, Christoph, & Müller-Birn, Claudia. (2020). *Participatory Design of a Machine Learning Driven Visualization System for Non-Technical Stakeholders*. https://doi.org/10.18420/MUC2020-WS109-287.

[3]   Birhane, A. (2020). Algorithmic Colonization of Africa. *SCRIPT-Ed*, *17*(2), 389–409. https://doi.org/10.2966/scrip.170220.389.

[4]   Bischof, A., & Jarke, J. (2021). Configuring the older adult: How age and ageing are re-configured in gerontechnology design. In *Socio-gerontechnology*, Taylor & Francis.

[5]   Bischof, A., Jarke, J., Pentzold, C., & Stolle, C. (n. d.). *Wie kann partizipative Wissenschaftskommunikation einer alternden digitalen Gesellschaft dienen?* 2.

[6]   Björgvinsson, E., Ehn, P., & Hillgren, P.-A. (2010). Participatory design and 'democratizing innovation'. In *Proceedings of the 11th Biennial Participatory Design Conference*, 41–50.

[7]   Boden, Margaret A. (2018). *Artificial Intelligence: A Very Short Introduction*. Oxford University Press.

[8]   Bødker, S., & Kyng, M. (2018). Participatory Design that Matters—Facing the Big Issues. *ACM Transactions on Computer-Human Interaction*, *25*(1), 1–31. https://doi.org/10.1145/3152421.

[9]   Bratteteig, T., Bødker, K., Dittrich, Y., Mogensen, P. H., & Simonsen, J. (2012). Methods: Organising principles and general guidelines for participatory design projects. In *Routledge international handbook of participatory design*, 137–164. Routledge.

[10] Bratteteig, T., & Verne, G. (2018). Does AI make PD obsolete?: Exploring challenges from artificial intelligence to participatory design. In *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial – Volume 2*, 1–5. https://doi.org/10.1145/3210604.3210646.

[11] Buchmüller, S., Maaß, S., & Schirmer, C. (2016). Zur Wirkungsweise partizipativer Verfahren in technischen Entwicklungsprozessen. In *Technische Unterstützungssysteme, Die Die Menschen Wirklich Wollen*, 443.

[12] Costanza-Chock, S. (2020). *Design Justice: Community-Led Practices to Build the Worlds We Need*. MIT Press.

[13] Crawford, K. (2021). *The Atlas of AI*. Yale University Press.

[14] Dencik, L., Hintz, A., & Cable, J. (2016). Towards data justice? The ambiguity of anti-surveillance resistance in political activism. *Big Data & Society*, *3*(2), 2053951716679678.

[15] Dunne, A., & Raby, F. (2013). *Speculative Everything: Design, Fiction, and Social Dreaming*. MIT Press.

[16] Ehn, P. (2008). Participation in design things. In *Participatory Design Conference (PDC), Bloomington, Indiana, USA (2008)*, 92–101.

[17] Ehn, P., & Badham, R. (2002). Participatory design and the collective designer. In *Proceedings of the Participatory Design Conference*, 1–10.

[18] Ehn, P., Nilsson, E. M., & Topgaard, R. (2014). *Making futures: Marginal notes on innovation, design, and democracy*. The MIT Press.

[19] Ehsan, U., Wintersberger, P., Liao, Q. V., Mara, M., Streit, M., Wachter, S., Riener, A., & Riedl, M. O. (2021). Operationalizing Human-Centered Perspectives in Explainable AI. In*Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–6. https://doi.org/10.1145/3411763.3441342.

[20] Endter, C. (2021). User Participation as a Matter of Care. The Configuration of Older Users in the Design of Assistive Technologies. *TECNOSCIENZA: Italian Journal of Science & Technology Studies*, *11*(2), 93–116.

[21] Escobar, A. (2018). *Designs for the Pluriverse Radical Interdependence, Autonomy, and the Making of Worlds*. Duke University Press. https://doi.org/10.1215/9780822371816.

[22] Fachgruppe Partizipation. (2019). *Manifest*. https://fg-partizipation.gi.de/gruendungsmanifest.

[23] Fleck, M.-J., & Marsden, N. (2021). *Contextual design of an novel elderly-centered system for video-based communication*. https://doi.org/10.18420/muc2021-mci-ws06-248.

[24] Franzke, A. S., Muis, I., & Schäfer, M. T. (2021). Data Ethics Decision Aid (DEDA): A dialogical framework for ethical inquiry of AI and data projects in the Netherlands. *Ethics and Information Technology*, *23*(3), 551–567. https://doi.org/10.1007/s10676-020-09577-5.

[25] Future Archive Method. (2021). *Future Archive Method*. https://thefuturearchiveblog.wordpress.com/methodology.

[26] Gransche, B., & Manzeschke, A. (2020). *Das geteilte Ganze: Horizonte Integrierter Forschung für künftige Mensch-Technik-Verhältnisse*. Springer-Verlag.

[27] Grüneberg, P. (2021). *Institutionalizing the integration of patient and clinical needs in the design process of medical technologies*. https://doi.org/10.18420/muc2021-mci-ws06-238.

[28] Halskov, K., & Hansen, N. B. (2015). The diversity of participatory design research practice at PDC 2002–2012. *International Journal of Human-Computer Studies*, *74*, 81–92. https://doi.org/10.1016/j.ijhcs.2014.09.003.

[29] Hofmann, A. (2021). *Partizipation im Kontext virtueller Psychoedukation*. https://doi.org/10.18420/muc2021-mci-ws06-246.

[30] Jarke, J. (2021). *Co-creating Digital Public Services for an Ageing Society: Evidence for User-centric Design* (Vol. 6). Springer International Publishing. https://doi.org/10.1007/978-3-030-52873-7.

[31] Jarke, J., & Maaß, S. (2018). Probes as Participatory Design Practice. *I-Com*, *17*(2), 99–102. https://doi.org/10.1515/icom-2018-0026.

[32] Maas, F., & Klüber, S. (2020). *"Lasst uns Gesichtserkennung auf dem Marktplatz einsetzen": Warum Dystopien PD Projekte voranbringen*. 2.

[33] Maas, F., & Wolf, S. (2021). *Und dann kam Corona: Ein Technikentwicklungsprojekt zwischen Partizipation und Wirklichkeit*. https://doi.org/10.18420/muc2021-mci-ws06-334.

[34] Mucha, H. (2021). *The World from My Bedroom: A Collection of Thoughts on Co-Design Through Screens*. https://doi.org/10.18420/muc2021-mci-ws06-244.

[35] Muller, M. J., & Druin, A. (2012). Participatory design: The third space in human–computer interaction. In *The Human–Computer Interaction Handbook*, 1125–1153. CRC Press.

[36] Nold, C. (2018). Practice-based ontological design for multiplying realities. *Strategic Design Research Journal*.

[37] Peine, A., Rollwagen, I., & Neven, L. (2014). The rise of the "innosumer"—Rethinking older technology users. *Technological Forecasting and Social Change*, *82*, 199–214.

[38] Perez, C. C. (2019). *Invisible women: Exposing data bias in a world designed for men*. Random House.

[39] Phillips, F. (2011). The state of technological and social change: Impressions. *Technological Forecasting and Social Change*, *78*(6), 1072–1078.

[40] Pröbster, M., Herling, C., & Marsden, N. (2021). *MAKEitREAL – Die partizipative Entwicklung von Makerspaces für Mädchen*. https://doi.org/10.18420/muc2021-mci-ws06-228.

[41] Raji, I. D., & Buolamwini, J. (2019). Actionable Auditing: Investigating the Impact of Publicly Naming Biased Performance Results of Commercial AI Products. In *Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society*, 429–435. https://doi.org/10.1145/3306618.3314244.

[42] Rießenberger, K. A. (2021). *Participatory Design and the Divide between Developers and Older Adults*. https://doi.org/10.18420/muc2021-mci-ws06-249.

[43] Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, *4*(1), 5–18. https://doi.org/10.1080/15710880701875068.

[44] Schäfer, M. T. (2011). *Bastard culture! How user participation transforms cultural production*. Amsterdam University Press.

[45] Schäfer, Mirko Tobias, & Clausen, Nelly. (2021). *Participatory Data Ethics*. https://doi.org/10.18420/MUC2021-MCI-WS06-316.

[46] Simonsen, J., & Robertson, T. (2012). *Routledge International Handbook of Participatory Design*. Routledge.

[47] Taylor, L. (2017). What is data justice? The case for connecting digital rights and freedoms globally. *Big Data & Society*, *4*(2), 2053951717736335.

[48] Vaupel, J. (2000). Setting the stage: A generation of centenarians? *The Washington Quarterly*, *23*(3), 195–200. https://doi.org/10.1162/016366000561097.

[49] Wanka, A., & Gallistl, V. (2018). Doing Age in a Digitized World—A Material Praxeology of Aging With Technology. *Frontiers in Sociology*, *3*, 6. https://doi.org/10.3389/fsoc.2018.00006.

[50] Weibert, A., Aal, K., & Ertl, T. (2021). *Und alle können das dann lesen...: Von der partizipativen Entwicklung eines Spiels über die Rolle(n) von Technik in unserem Alltag*. https://doi.org/10.18420/muc2021-mci-ws06-247.