PANEL #3

Accountability from a transdisciplinary perspective

Panel #3 of the Sensing & Sensibility initiative at the University of Siegen with its focus on "accountability" builds upon two prior discussion panels that explored "performance" and "satisfaction" of sensor technologies from a transdisciplinary perspective in December 2020 and February 2021.

This third panel took place in April 2021 and was moderated by Prof. Carolin Gerlitz. We asked: What comprises accountability of sensor technologies? Furthermore, can we hold such technologies accountable by making them interpretable and explainable? Finally, what are the methods that would be suitable in exploring accountability of sensor technologies by considering their developers, users, but also researchers?

Tristan Thielmann, Professor for Science and Technology Studies, started the panel with a view upon accountability from the perspective of ethnomethodology. Thielmann argued that accountability is the key concept of ethnomethodology as it frames every human interaction and cannot be solely reduced to description of algorithmic accountability as *Rechenschaftspflicht*. The ethnomethodological perspective stresses the importance of researching historically and materially contingent habitual practices and methods that both constitute and enable the research of societal relationships. This research approach posits diverse ways of interacting and cooperating that are key in constituting the social world. In this context, accountability not only implies being *rechenschaftsfähig* in terms of explainability, but being "reportable, calculable, liable, attributable", also by sensor media.

Thielmann exemplified this approach with streaming practice of Netflix, which is both watched by and watches its viewers to measure effects of shown films. According to Thielmann, societal interaction takes the form of dialogue and one-to-one interactions, and media technologies such as Netflix should also be perceived as a network that establishes many different connections. In this way, a form of algorithmic accountability normalises specific forms of interaction, and its key specificity is that each of these individual connections are constituted by sensors' filtering decisions that are dependent on individual situations. The decisive question, according to Tristan Thielmann, is the following: "how to develop sensors in which certain rules of the social system are already inscribed, and what are these rules in particular?"

From a sociological perspective, Priv.-Doz. Dr. Yasemin Niephaus discussed accountability in the context of data collection and handling. In contrasting more traditional modes of data collection and analysis in sociological research with Big Data, Niephaus discussed emerging challenges for privacy and informational self-determination. Sociological data about different social contexts is commonly collected from individual and collective actors through surveys and observations. To generate knowledge from this data, they are attributed, which leads to the right to informational self-determination being preserved. This is politically and legally unproblematic. The accumulation and analysis of data, however, becomes problematic, when it is not collected for knowledge generation, as in scientific practices of sociology, but accumulated as so-called Big Data in everyday life contexts through digital technologies.

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Niephaus argued that it is important to ask how we can characterize Big Data and what consequences do emerging modes of data production and analytics have for privacy and data protection? In the context of Big Data, the right to informational self-determination may not be exercised effectively due to a lack of knowledge about what kind of data is being generated or a lack of alternatives for deciding upon this generation process. This brings legal problems and can lead to legal regulation. From a sociological perspective, when one is unaware of the fact that they are producing data, it can lead to power imbalance. And finally, Niephaus pointed toward a social imbalance, because not everyone has access to the same digital technologies and is able to use them in similar ways; this is an issue raised in discussions on first and second order digital divides. According to Niephaus, some ways to deal with these problems are the following: strengthening the supervisory bodies of the state for non-public data inventories; raising awareness of companies not only about the possibilities of extracting unstructured data, but also about their accountability to the public; cooperating between science, politics and business, civil society actors to strengthen governance; the education for public good.

From the perspective of political science, Prof. Dr. Christoph Strünck discussed accountability in relation to digital healthcare. His understanding of accountability draws from the classical perspective of democratic theory and is concerned with accountability as *Rechenschaftspflicht* which aims for a responsive relationship between government and citizens.

Due to new technologies such as smartphones and smartwatches – or wearables in general – patients are increasingly recording health data themselves, which can play an important role in the healthcare system. This raises questions, such as "Who has to be accountable to whom?", "Where is transparency needed?". To differentiate these questions, Strünck broke down the question of accountability in digital healthcare into five dimensions. First, data collection, to which patients must agree. Here, the question arises whether they can make this decision in a well-informed manner at all. Second, the data storage, for which the question of permission and access arises. Third, the programming of the algorithms, which follows a defined objective. However, the programming and the objective definition are carried out by different people, so who is accountable to whom? Fourth, the interpretation of the data, where Strünck emphasized the question of the range of interpretation. He illustrated this with the example of radiology: AI systems in radiology have an accuracy of 99%, whereas experienced radiologists have an accuracy of 85%. Therefore, who of both - AI or human - is deciding in practice (regardless of liability)? The fifth and last dimension to be addressed is the data use. Here, Strünck raised the question of who has to agree to which purposes of use? Also, is the data covered by the protection of privacy or is it of such elementary social benefit that it must be declared a common good? Following these differentiated questions about the accountability of future health data, Strünck emphasized that these questions can only be answered in an interdisciplinary way.

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Furthermore, he posited that sensor-based evidence is only one of several sources of evidence. Analyzing and moderating the interplay of different evidence sources is also a task of future research. The same applies to the question of shifts in power and influence between physicians, patients and other parties in the healthcare system.

In Panel #3, we explored the meanings and practices around accountability of sensor technologies in the field of sensor technologies, which are increasingly used in our everyday life but seem less understandable and accessible due to their technological intricacy. We also debated how complex technological developments account not only for positive aspects of information access and sharing, but also problems such as algorithmic biases, expansive surveillance, and often exclusion of the public in their development. For some, accountability carried a broad meaning of reflective practice that implies different situations as well as heterogeneous actors. For others, accountability of sensor technologies is carried out within complex societal processes, where some actors have more power than others in gathering as well as using big amounts of data and should be discussed and regulated. For still others, the question of accountability is an important anchor that, in the technologization of jobs and professions, serves to raise many more questions that need to be answered in an interdisciplinary way.

Upcoming events will explore how futures are made sense of in the context of sensor technology research across disciplines. We will discuss how possible futures are anticipated in the development of sensors, how use scenarios are accounted for and how future practices can be addressed.

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