Workshop: Sensing the sensor: exploring and mapping situational dimensions of sensory media and data

The contemporary digital media landscape, our everyday communication technologies and practices are marked by continuous computational tracking and tracing mechanisms, building on and pushing ever increasing modes of data capture informing about our bodies and behavior, the interactions we have with each other, our environments, and these technologies. Such *sensing infrastructures* are thriving on allegedly seamless background operations of and communication between sensors implemented in mobile media technologies and network connections. These infrastructures generate endless flows of data that is machine-readable but remains largely opaque and inaccessible to users. In this workshop, we suggest approaching mobile sensing technologies and practices through thinking of them as *multiply situated* (cf. Dieter et al., 2019): Sensor data is subject to and originates in specific sensing *situations*, whilst being entangled in and having the capacity to *sense* and capture information about such situations.

This **1 ½ day hybrid workshop (Monday & Tuesday, 28-29 November 2022)** starts from the observation that sensor data can only be understood in situated ways that take its distributed accomplishment involving computational capacities, hardware, geolocations, practices, and users into account. The workshop revolves around an empirical exploration of sensor data enabled and collected through the mobile activity tracking app Strava, employing novel "sensory digital methods." In doing so, the workshop explicitly engages with the ways in which such methods *interface* the study of the social and more technical work on the media at stake, and thus, how "sensory digital methods" tools also interface the interdisciplinary cooperation between diverse researchers with more and less computational skills.

Why Strava?

Strikingly, Strava (2020) recently launched Strava Metro, a platform for (local/regional) governmental organizations and purposes, having the declared ambition to offer 'real-time' and "human-powered traffic" data to inform policy-making and political action taking for mobility, transport and infrastructure monitoring and planning. The Strava app and platform, and the data infrastructures that they bring about and build upon to function properly, is an important case study in the research of one of the workshop organizers (Daniela van Geenen) due to their position at the interface between digital media technology for personal use and social interaction and data-based service provider for industry and governmental purposes. That is to say, data from mundane, more private contexts is reappropriated for public settings and interests.

Empirical work and workshop aims

In our empirical exploration, we draw on and put newly developed tools to explore different computing situations of sensor data into practice, which we termed "sensory digital methods" (Chao et al., expected 2022):

- Using AppInspect, a tool developed by Jason Chao at the CRC "Media of Cooperation" (University of Siegen) which allows for systematic analysis of app development kits, we show how access to sensor data is realized and evoked computationally and how third parties write themselves into it. Preliminary empirical

work using AppInspect, conducted in a collaborative data session by Daniela van Geenen and Jason Chao, showed that Strava has access to sensitive, body-related personal data collected through sensors of mobile devices. Based on Android Package Kits' (APKs) permissions retrieved through Google Playstore, AppInspect discloses that the relevant permissions are even classified as "dangerous". **The workshop will offer the possibility to actively explore AppInspect. Preprepared materials on and from Strava will serve as an entry point to do so.**

- In addition, we explore the network connections enabled by Strava using AppTraffic, a tool for dynamic, mobile analysis of data flows from and to apps, also developed by Jason Chao. We analyze these network connections in relation to their specific use situations, their changes over time and geographical distribution. Network connections and therewith infrastructural embeddedness and geopolitics of sensor data, can only be accounted for in a situated way, as their evocation is dependent on location, time, and user data practices. AppTraffic allows to sense the computational and infrastructural situations of the sensor-based app. **The workshop will offer a demonstration of AppTraffic. Moreover, the preprepared materials featured in the workshop will focus on various *use situations* of Strava on a mobile phone, captured simultaneously through in-app recording, screen capture, and AppTraffic to access background operations.**

- Note that for both practical parts, there is **NO preparation needed**, except from bringing a working laptop to the workshop.

Finally, this workshop is interested in carving out analytical mapping approaches (cf. Clarke, 2005 in Marres, 2020) for the quite heterogeneous situational dimensions addressed in this investigation, the involved human and non-human actors and their relations, including diverse discursive-material properties, the values mobilized and politics at stake.

Questions that we pose during the workshop:

- How can we (empirically) access, stage, and make sense of sensory media and data, using the lens of "sensing situations" involved in activity tracking apps, in particular Strava?
- What research questions do tools like AppInspect (for static analysis of apps and their infrastructures) and AppTraffic (for dynamic analysis of network traffic of apps in practice) invite or afford for the study of sensory media and data?
- Which opportunities do these tools offer to evoke and study computational situations, from an infrastructural and "multi-situated" perspective (cf. Dieter et al., 2019)?
- Are there additional research questions or purposes that are not (yet) addressed, but would be desirable; also in relation to your own research projects?
- How does the lens of sensing situations help to stage, frame, and assess relevant research situations?
- What are the methodological implications and what ways of situational analysis and mapping (cf. Marres, 2020) might be fruitful?
- On a conceptual level, what are the lessons that we can already draw for *critical sensor data studies*?
- Where to go from here (maybe also cooperatively)?

Workshop schedule

28 November (on location & online), 1:30 pm to 6 pm (CET)

1:30 - 2 pm	Welcome, empirical & theoretical embedding
2 - 3 pm	AppInspect presentation & exploration: intro to sensor data
20 minutes break	
3:20 - 3:50 pm	Presentation research protocol & data
3:50 - 5:20 pm	Explore tool & exploration of data/sensing situations
5:20 pm - end	First day wrap-up, questions (for day 2) & reflections

29 November (on location & online), 10:00 am to 5 pm (CET)

10:00 - 11:30 am	AppTraffic presentation/demonstration: intro to network connection and traffic data
11:40 - 12:10 am	Presentation research protocol & data
12:15 pm - 1:15 pm	Working with Strava network traffic (AppTraffic & Wireshark)
90 minutes lunch break	
2:45 – 4:15 pm	Brainstorm about and mapping of “sensing situations” (breakout sessions & wrap-up)
4:25 pm - end	Future research questions & situations? What (more) is needed to make sense of sensory media and data?

Biography

Chao, J., Geenen, D. van, Gerlitz, C., and Vlist, F. van der (expected 2022). Digital Methods for Sensory Media Research. *Convergence: The International Journal of Research into New Media Technologies.*

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Gabrys, J. (2014). Programming Environments: Environmentality and Citizen Sensing in the Smart City: *Environment and Planning D: Society and Space*. https://doi.org/10.1068/d16812

Marres, N. (2020). For a situational analytics: An interpretative methodology for the study of situations in computational settings. *Big Data & Society*, *7*(2), 2053951720949571. https://doi.org/10.1177/2053951720949571

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Strava (2020). *Strava Metro Home*. https://metro.strava.com/

Tkacz, N., Henrique da Mata Martins, M., Porto de Albuquerque, J., Horita, F., & Dolif Neto, G. (2021). Data diaries: A situated approach to the study of data. *Big Data & Society*, *8*(1), 205395172199603. https://doi.org/10.1177/2053951721996036