

WTMC Series on Teaching and Learning STS

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Directions

Instead of a map of how to get to Soeterbeeck, we provide a map of how to get to our chosen platform and an introduction of our guide for this journey... We will be using Zoom in connection with the collaborative workspace Mural (www.mural.co) and an (informal) meeting platform (probably Gathertown). Each day has a different Zoom link. You find all links at several places in the program below. What can you expect? During most of the day we will make use of Zoom, sometimes we'll also start Mural to give you the chance to make collaborative notes and prepare questions for the presenters, or to simply exchange ideas and thoughts among each other.

We have also planned a short initial information session to start us off. That way, we will be able to introduce you to the workshop, check any technical issues and ensure that we are all ready to go when we introduce ourselves to each other and start the lectures and activities.

Practical notes

To do before the Workshop

Allow about two weeks for preparation of this workshop. The compulsory literature consists of roughly 270 pages. At 8 pages per hour, this takes about 34 hours. We expect you to spend about 6 more hours to prepare the skills training, and read part of the recommended literature as you wish. This amounts to 40 hours in all, which is the standard amount of preparation time for a workshop. In preparation, proceed as follows:

1. Read the detailed programme and pay special attention to the activities so that you know in advance what you need to prepare and think about. There is preparation for the skills workshop that you need to do BEFORE the workshop.
2. Read all literature before you arrive. There is no time to read during the workshop. Make notes about what you don't understand, questions you would like to ask, things you want to discuss.
3. Check the programme to see if you are a discussant for one of the PhD presentations. Look at the instructions towards the end of this programme which contains guidelines for presenters, discussants and all others!
4. All mentioned time-slots are expressed in **Central European Summer Time (CEST)**, for conversation to your location and time zone please use websites such as: <https://www.timeanddate.com>
5. Please don't forget to attend the **workshop information meeting 13th of April, 4pm CEST**, prior to the start of the workshop!

Attendance and cancellation

- *The workshop will be a mediated, largely synchronous event.* In this context, attendance means being logged on with your camera on, as much as bandwidth allows. In order to prevent connection problems, we recommend to use a wired internet connection. Almost all modern routers allow for connections with a network cable. It also means participating in the asynchronous activities that we have included in the programme in order to limit screen fatigue.
- In order to receive credit for attending the workshop, *you are required to be present throughout the entire event.* Only calamities are grounds to depart from this rule. If this creates problems, then please contact the coordinators beforehand and as soon as possible.
- On *Thursday* there will be poster presentations and a virtual coffee bar! Make sure that a good cup of coffee and/or tea is ready.
- If, for any reason, you are unable to attend the workshop, please let Elize Schiweck (e.schiweck@utwente.nl) know as soon as you can. We may be able to offer your place to someone on the waiting list if we know soon enough. If notice of cancellation is received more than 10 working days prior to the start of the workshop, you will receive a refund for all of the fees, minus €150 to cover the costs of administration and course materials. In the case of cancellations received less than 10 working days before the start of the workshop, fees and any other costs that have been incurred by WTMC will not be refunded.

Programme

Tuesday, 13-04 (16:00-17:00):

0.1: Intro to workshop (ask any question, getting to know each other, intro to technicalities), Zoom link

	Wednesday 21-04 ⇒ Zoom link	Thursday 22-04 ⇒ Zoom link	Friday 23-04 ⇒ Zoom link
Time (CEST)	Databases	Infrastructures	Practices of Datafication
9.00-9.15		2.1 What kept you awake?	3.1 What kept you awake?
9.15-10.30		2.2 Core reading: The Mirage of a Space between Nature and Nurture	3.2 Sharif Islam, Of Bible, Bees, and Babbage: History, Natural Science Collections, and modern data Infrastructures, Lecture
10.30-11.00	Logging in and welcome	break	break
11.00-12.15	1.1 Tahani Nadim, Data natures at the natural history museum, Lecture	Time off	3.3 Clemens Driessen, Practices of datafying animals. Lecture
12.15-13.15	lunch	lunch	lunch
13.15-14.30	1.2 Claire Waterton, Working “Athwart” in the Barcoding of Life, Lecture	2.4 Poster presentation and social activity	3.4 Skills session 2
14.30-15.00	break	break	break
15.00-16.30	1.3 PhD presentations 1	2.3 PhD presentations 2	Farewell & virtual group photo
16.30-17.00	break	break	
17.00-18.15	1.4 Skills session 1	2.5 Christine Borgman & Morgan Wofford, Data, Code, and Pipelines: Knowledge Infrastructures in Astronomy, Lecture	
18.15-19.00	dinner	dinner	
19.00-20.30		2.6 David Ribes, Sedimentary Legacy for Research Infrastructure: from Natural to Socio-Ecological, Lecture	

Introduction to the Workshop

Welcome to the Workshop. Together with our guest speakers, we will explore datafication. The exploration starts here, well before you arrive at the online event. This programme, together with some texts, provides the luggage for your journey. Travel well prepared!

It is advisable that you first carefully study the whole programme, before embarking on the actual reading. This should help you get a sense of the themes and how they connect, and how specific texts fit in those themes. The compulsory reading material amounts to (the equivalent of) roughly 270 pages, which at 8 pages per hour would take you about 34 hours to study. Also, some assignments require preparation, others require you to bring certain things. And finally, we will have a number of participant presentations. Take care to know whether you are scheduled as a discussant for one of them.

For each of you, the ideas and concepts discussed during the workshop will have different kinds of relevance. This depends on your research topic and method, the phase you are currently in, and your personal interest. The workshop is not a “one size fits nobody” event, and getting the most out of it does require some work. Make sure that you have in mind what you would like to learn, and how that can be achieved. In general, it is good practice to prepare one or more written questions about the reading material for each session. This helps focus your attention during lectures, and it ensures that you have something to contribute to the discussion, especially if you are not that eager by nature to join discussions. Of course, going with the flow and welcoming things the way they happen to come to you, is also an important mode of learning. So here we go.

Datafying non-humans

Over the last forty years, scientific endeavours and related policy initiatives have been strongly shaped by datafication. Many of these current endeavours, whether space exploration, genomics or addressing climate change rely on complex digital objects, formed by global networks of data flow. For example, the scientific study of the world’s floral and faunal diversity has undergone a major transformation: once the study of naturalists and biologists who only booked slow progress in cataloguing all life on earth, it has gradually turned into a rapidly advancing and data-intensive field which promises to offer solutions to major societal challenges of the twentieth century, including food security, biodiversity loss, and climate change. By approaching such datafication practices from an STS perspective, this workshop examines social, cultural and political aspects that have shaped the digital production of knowledge related to scientific research since the second half of the twentieth century. This is also the occasion to reflect on how data and the digital are implicated in re-drawing human/non-human distinctions. Moreover, the workshop invites participants to think about how a reflexive understanding of the datafication of non-humans (including nature) could enable society and policy makers to develop better, more accountable and realistic approaches, on a local, regional and a global scale.



On Wednesday, we will be focusing on ‘databases’ as sediments of datafication in different scientific realms.

On Thursday we discuss data infrastructures. While our first speaker puts the emphasis on dynamics of digital knowledge production, data reuse and maintenance, our second speaker examines the digital long-legacy which instruments, data and specimens have.

On Friday, our speakers examine data practices. The day starts with a talk on a large-scale European digital research infrastructure in the field of biodiversity science which is currently developed. Later in the day, we’ll hear more about wanted and unwanted consequences of the datafication of animals.

We hope you will enjoy preparing for this workshop and look forward to meeting you (again) in a few weeks!

Anne Beaulieu and Andreas Weber

Detailed overview

Intro to workshop

During this intro meeting on Tuesday April, 13 2021 (the right zoom link is mentioned in the table above) we would like to briefly introduce the workshop and some technicalities to you. Moreover we offer each of you the chance to introduce yourself to the group. And of course, there is also a chance to ask questions.

Wednesday: Databases

1.1 Lecture, Tahani Nadim, Data natures at the natural history museum

In this talk I will introduce the datafication of nature in the context of the Museum für Naturkunde Berlin. The datafication of nature encompasses a broad spectrum of scientific practices dedicated to capturing and accounting for biological, geological and atmospheric matters and materials. On the one hand, this creates the basis for further scientific inquiries such as modelling (e.g. models of land use, climate change) and trend analyses (e.g. biodiversity loss, species distribution). On the other, these data form central boundary objects that are negotiated between organisational, social and political domains. They are important mediators (or intermediaries) between, for example, environmental protection agencies, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), urban development agencies, or border control regimes. Thus, the datafication of nature connects scientific and political problematisations, opening a novel problem space between naturecultures, infrastructure studies and critical data studies. My talk will focus on historical and present data practices that turn animals into specimens, specimens into data and data into new specimens.

Readings

Chadarevian, Soraya de (2018) Things and Data in Recent Biology, *Historical Studies in the Natural Sciences* 48 (5): 648–658.

Geismar, Haidy (2013) Defining the digital. *Museum Anthropology Review* 7(1-2)

1.2 Lecture, Claire Waterton, Working “Athwart” in the Barcoding of Life

In my session I draw on the idea of working “athwart” (Hustak and Myers 2012) in the barcoding of life. This means reading the practice of barcoding life somewhat “against the grain” - turning slightly sideways perhaps, so that the more muted registers of this scientific practice can be enhanced and become the subject of curiosity, questions and imagining. The Barcoding of Life Initiative (BOLI) is an ambitious and hubristic exercise and working athwart on it has brought three aspects to the fore: barcoding as culture natures; relations and trouble in the barcoding flow; de- and re-materialising natures.

Readings

Waterton, Ellis and Wynne (2013) *Barcoding Nature: shifting cultures of taxonomy in an age of biodiversity loss*. Abingdon: Routledge. Chapter 1, Introduction, pp 1-15.

Hustak, C. and Myers, N., 2012. Involuntary momentum: Affective ecologies and the sciences of plant/insect encounters. *differences*, 23(3): 74-118.

1.3 PhD Presentations

Presenter: Jackie Ashkin Discussant: Caroline Anna Salling

Presenter: Ivan Veul Discussant: Alicja Ostrowska

Presenter: Sarah Inman Discussant: Joyce Hoek

1.4 Skills session 1: Comparing Genres and Data

During this first skill session, you will discuss in small groups (max. 3-4) your analytical descriptions of the data genres you are working with. Please evaluate with each other what the affordances and limitations of the genres you have chosen and described are. Please summarize the result of your discussion on one ppt slide.

Preparation of skills sessions (prior to the begin of workshop!

During the workshop we will be using two skills session (skills session 1.4 and 3.4) to reflect upon what the choice of a framing for 'data' means for your writing process. In order to prepare for the skills sessions please ...

1] read the text by Annette Markham (see reading 1.4.1). Markham reflects on how **different frames are constitutive of different** ways data speaks to us. This casts a doubtful light on the very notion of 'data': the literal meaning is 'given', suggesting that it exists a priori to our observation, whereas her argument shows that our engagement with data is much more of a productive than a merely observative affair.

2] After you have read the text, think of data which you use for your own research. Preferably use empirical material (can be a dataset, can be statistical data, can be interviews), but if you are in an early stage of your research or are not planning to do empirical research, you may use literature you are reviewing or theoretical frameworks you are using or developing.

3] Write an analytical description of your data in **two genres**, max one page each, prior to the workshop. You may naturally think of a written text as your standard genre. This exercise challenges you to find different frames of representing material, and experience with the typical frames that come with the choice for a genre.

4] Bring them with you to the workshop in digital format (ideally as pdf, or as one ppt slide) and be able to present them during the skills sessions.

5] While working on this **keep the following questions in mind**: Have I ever thought on describing my material in a different genre (e.g. a table, or a visualisation)? Can you think of a way to visualize what you have at hand? Which options are there to circumvent the fundamental linearity of a text? What kind of frame, or ontology if you like, is implied by these genres?

Reading

Markham, A. (2013). [Undermining ‘data’: a critical examination of a core term in scientific inquiry](#). First Monday, peer-reviewed journal on the internet 18(10).

Thursday: Infrastructures

2.1 *What kept you awake*

2.2 *Core reading: The Mirage of a Space between Nature and Nurture*

In this session, we will discuss the work of philosopher and historian of science Evelyn Fox Keller, (2010) *The Mirage of a Space between Nature and Nurture*. We will read the introduction and the first chapter only. The discussion will proceed first in small groups and then in a larger setting. Please come prepared to share your insights and questions about the text. Here some questions to orient your reading. You may decide to use them in the small group discussions or focus on your own questions.

1. What do you see as Fox Kellers’ main invitation? Are we to give up on explanation? Should we embrace ambiguity? Or does Fox Keller plead for a new kind of complexity in biology?
2. Fox Keller states that “the notion of interaction presupposes the existence of entities that are at least ideally separable—i.e., it presupposes an a priori space between component entities—and this is precisely what the character of developmental dynamics precludes” (6). “What do you think of this statement?”
3. There is longish reflection on ‘slippage’ between terms, for example, between statistics and mechanisms. How has datafication and the increasingly digital setting in which much genetics research is pursued affected this slippage? (Note that data is hardly mentioned in the book and database not at all.) How might the intersection of technology affect this tendency to slippage?

2.3 *PhD presentations 2*

Presenter: Monica Vasile Discussant: Anne-Sofie Lautrup Sørensen

Presenter: Alicja Ostrowska Discussant: Chiara Carboni

Presenter: Kaya Akyüz Discussant: Carla Greubel

2.4 Poster presentation and social activity

2.5 Lecture, Christine Borgman & Morgan Wofford, *Data, Code, and Pipelines: Knowledge Infrastructures in Astronomy*

This talk will workshop a draft paper by C.L. Borgman and M.F. Wofford that addresses the ‘co-evolution’ of digital knowledge infrastructures’ by studying how astronomers employ software pipelines to calibrate, clean, and reduce “raw data” into useful scientific evidence. Pipelines are essential, but often invisible, components of the knowledge infrastructures of astronomy. By comparing how pipelines are employed to produce data in three astronomy projects with differing scientific goals, we contrast knowledge production and data production work, data reuse practices, maintenance and repair activities, and the durability and fragility of their knowledge infrastructures. Our findings are based on 11 years of interviews and ethnography. Astronomers focus primarily on knowledge production, from designing studies through writing papers and maintaining data for local reuse. Data production resulting in archives for public use requires additional labor and different skill sets. Astronomers report a general lack of recognition and budget for the work required to maintain infrastructure. We discuss implications for open science, replicability, and reproducibility of astronomy research.

Required reading

Borgman & Wofford, In Progress (this reading will be sent to you later)

Borgman, C. L. (2019). The lives and after lives of data. *Harvard Data Science Review*, 1(1). <https://doi.org/10.1162/99608f92.9a36bdb6>

Borgman, C. L., Darch, P. T., Sands, A. E., & Golshan, M. S. (2016). The durability and fragility of knowledge infrastructures: Lessons learned from astronomy. *Proceedings of the Association for Information Science and Technology*, 53, 1–10. <http://dx.doi.org/10.1002/pr2.2016.14505301057>

Recommended reading (optional)

Borgman, C. L., Darch, P. T., Pasquetto, I. V., & Wofford, M. F. (2020). *Our knowledge of knowledge infrastructures: Lessons learned and future directions* (Alfred P. Sloan Foundation, p. 27). University of California, Los Angeles. <http://escholarship.org/uc/item/9rm6b7d4>

Borgman, C. L., & Wofford, M. F. (In Progress). *Data, Code, and Pipelines: Knowledge Infrastructures in Astronomy*. TBD.

Borgman, C. L., Wofford, M. F., Golshan, M. S., & Darch, P. T. (2021). Collaborative qualitative research at scale: Reflections on 20 years of acquiring global data and making data global. *Journal of the Association for Information Science and Technology*, n/a(n/a). <https://doi.org/10.1002/asi.24439>

Darch, P. T., Sands, A. E., Borgman, C. L., & Golshan, M. S. (2020). Library cultures of data curation: Adventures in astronomy. *Journal of the Association for Information Science and Technology*, 71(12), 1470–1483. <https://doi.org/10.1002/asi.24345>

Darch, P. T., Sands, A. E., Borgman, C. L., & Golshan, M. S. (2021). Do the stars align?: Stakeholders and strategies in libraries’ curation of an astronomy dataset. *Journal of the Association for Information Science and Technology*, 72(2), 239–252. <https://doi.org/10.1002/asi.24392>

Pasquetto, I. V., Borgman, C. L., & Wofford, M. F. (2019). Uses and Reuses of Scientific Data: The Data Creators’ Advantage. *Harvard Data Science Review*, 1(2). <https://doi.org/10.1162/99608f92.fc14bf2d>

2.6 Lecture, David Ribes, Sedimentary Legacy for Research Infrastructure: from Natural to Socio-Ecological

This talk tracks the transition and tribulations of ecological science as the field has sought to transition from a bio-geophysical approach to a socio-ecological approach, particularly inspecting the case of soil science. Generally, ecological science can be characterized as on a trajectory to accepting the socioecological view -- approaching humans and their activities more centrally for ecological science. But this transition has been persistently hampered by a long-legacy of instruments, data and specimens that exclusively target bio-geophysical phenomena. I focus on the changing resources -- such as data and specimens -- that scientists have amassed across the years to investigate these shifting ontologies for ecology. I argue that ecological research (and long-term research infrastructure more generally) displays a 'sedimentary legacy': even as new data and specimen collections are added, older collections continue to exert persistent and consequential influences on contemporary research. Ultimately, this puts socioecology on a challenging up-hill trajectory to establish its scientific claims, though not a hopeless one.

Readings

Ribes, D. and J. B. Polk (2015). "Organizing for ontological change: The kernel of an AIDS research infrastructure." *Social Studies of Science* **45**(2): 214-241.

David, P. (1986). *Understanding the Economics of QWERTY: The Necessity of History.* *Economic History and the Modern Economist.* W. N. Parker: 30-49.

Friday: Practices of Datafication

3.1 What kept you awake?

3.2 Lecture, Sharif Islam, Of Bible, Bees, and Babbage: History, Natural Science Collections, and modern data

Recent biodiversity research has been propelled by a veritable explosion in the availability of data describing the distribution, function, and history of life on earth. In addition to new observational data, various projects around the world are digitizing a massive number of specimens deposited in natural history museums. These specimens, along with other historical records such as field notes and illustrations, provide data spanning decades and sometimes centuries. At the same time, advances in genomics, data analytics, machine learning techniques, and the availability of customized software packages are enabling new data-centric, computational, and algorithmic approaches of unprecedented scope, speed and scale.

Distributed System of Scientific Collections (DiSSCo) -- a new European Research Infrastructure currently in the preparation phase -- is working in this data landscape toward the goal of transforming silos of natural science collections into an integrated data infrastructure. This endeavor not only includes the data element, but institutions of varying sizes and capacities, and the people curating, maintaining, and using the collections and data. However, the availability of data and computational and analytical capacities are by themselves not enough to deliver a renewed

understanding of the variety, distinctiveness and complexity of all life on earth, let alone issues of biodiversity loss, climate change, etc. To take full advantage of these new capacities, data need to be properly identified, contextualized, historicized, curated, linked, cited, and archived. The goal of this lecture is to outline a nuanced understanding of the technical landscape that DiSSCo will be a part of where the datafication is not just happening about the natural world but also the social, material, and cultural worlds as well. The interdependencies and interactions between these worlds also affect how researchers and the public will use DiSSCo services.

The first part of the lecture will provide a trajectory of modern biodiversity research (and by extension modern scientific research) from the Biblical/Adamic naming of the animals (Genesis 2: 19–20) through Linnean Systematics, colonial expeditions (as a result of which flora and fauna travelled between Europe and Asia in a myriad fashion), and scientific revolutions, to our current pre-occupations with data science and Artificial Intelligence. Building on this historical context, the lecture will introduce the technical design concept of DiSSCo and some of the related social and technical challenges. The goal is to provide a multidisciplinary theoretical approach to understand data infrastructures such as DiSSCo and related domain expertise in a broader socio-technical context.

Required reading

Iliadis, A. and Russo, F., 2016. Critical data studies: An introduction. *Big Data & Society*, 3(2), p.2053951716674238. <https://doi.org/10.1177%2F2053951716674238>

Islam, S., Hardisty, A., Addink, W., Weiland, C. and Glöckler, F., 2020. Incorporating RDA Outputs in the Design of a European Research Infrastructure for Natural Science Collections. *Data Science Journal*, 19(1). <http://doi.org/10.5334/dsj-2020-050>

Sterner, B., Franz, N.M. Taxonomy for Humans or Computers? Cognitive Pragmatics for Big Data. *Biological Theory* 12, 99–111 (2017). <https://doi.org/10.1007/s13752-017-0259-5>

Suggested reading

Leonelli, S., 2016. *Data-centric biology: A philosophical study*. University of Chicago Press. <https://doi.org/10.7208/chicago/9780226416502.001.0001>

References used in the presentation at the workshop:

The Atlantic: *Why the Pandemic Experts Failed. We're still thinking about pandemic data in the wrong ways* <https://www.theatlantic.com/science/archive/2021/03/americas-coronavirus-catastrophe-began-with-data/618287/>

Bratton, B.H., 2015. The stack: on software and sovereignty.(Software studies). <https://mitpress.mit.edu/books/stack>

Harrison, P., 2009. Linnaeus as a second Adam? Taxonomy and the religious vocation. *Zygon*®, 44(4), pp.879-893. <https://doi.org/10.1111/j.1467-9744.2009.01039.x>

Wilson, D.C., 2018. Babbage among the insurers: Big 19th-century data and the public interest. *History of the Human Sciences*, 31(5), pp.129-153. <https://doi.org/10.1177%2F0952695118818978>

The Wired: *The End of Theory: The Data Deluge Makes the Scientific Method Obsolete*
<https://www.wired.com/2008/06/pb-theory/>

Two examples of public discussions about terms and definitions in standards:

<https://github.com/tdwg/dwc/issues/302> (about the term basisOfRecord)
<https://github.com/CatalogueOfLife/general/issues/6> (about taxon identifier)

Another public thread where the concept of Digital Extended Specimen is being discussed:
<https://discourse.gbif.org/t/structure-and-responsibilities-of-a-digextspecimen/2533>

And I didn't mention this one but might be interesting to understand how decisions are made about research infrastructures in the EU:

Burgelman, J.C., 2021. Politics and Open Science: How the European Open Science Cloud Became Reality (the Untold Story). *Data Intelligence*, 3(1), pp.5-19. https://doi.org/10.1162/dint_a_00069

3.3 Lecture Clemens Driessen, Practices of datafying animals

When looking at the datafication of animals, we can explore how through data certain versions of animals and ecologies are produced, but also how in practices of gathering, analysing and using data there are other ways of relating and knowing present as well. These may be needed to make sense of the data, and are sometimes proposed in contrast or competition with datafied animals/ecologies. In this session we can explore these questions in relation to debates over conservation and use of animals in various settings.

Here Jamie Lorimer offers a general overview of a range of conceptual developments in relation to conservation in theory and in practice, drawing on debates in STS, ecology and geography (Lorimer 2012). The French philosopher and biologist Vinciane Despret has written extensively about histories of shifting interpretations of animal behaviours. To get a flavour of the debates involved, we can read chapter P for Pretenders (Despret 2016). Together with an animal scientist (Driessen et al 2015), I studied the dynamics that ensued when farmers started adopting milking robots, looking into the back-and-forth of mutually adapting cows, robots and farmers. Do milking robots and the data they produce distance and perhaps alienate farmers and cows, or do they configure different relations? And what do the cows think of all this?

We can take these readings as starting points to discuss the lives of animals in technological cultures, and the ways in which their liveliness may be revealed and/or hidden in various forms of datafication and the attending practices of caring, knowing and managing animals.

Readings

Driessen, C., & Heutinck, L. F. (2015). Cows desiring to be milked? Milking robots and the co-evolution of ethics and technology on Dutch dairy farms. *Agriculture and Human Values*, 32(1), 3-20.

Lorimer, J. (2012). Multinatural geographies for the Anthropocene. *Progress in Human Geography*, 36(5), 593-612.

P for pretenders; Can deception be proof of good manners? In: Despret, V. (2016). *What would animals say if we asked the right questions?* (Vol. 38). U of Minnesota Press.

Suggested Readings (optional)

Benson, E. S. (2014). Minimal animal: Surveillance, simulation, and stochasticity in wildlife biology. *Antennae*, (30), 39.
https://repository.upenn.edu/cgi/viewcontent.cgi?article=1046&context=hss_papers

Ampumuza, C., & Driessen, C. (2020). Gorilla habituation and the role of animal agency in conservation and tourism development at Bwindi, South Western Uganda. *Environment and Planning E: Nature and Space*, 2514848620966502.

Boonman-Berson, S., Driessen, C., & Turnhout, E. (2019). Managing wild minds: From control by numbers to a multinatural approach in wild boar management in the Veluwe, the Netherlands. *Transactions of the Institute of British Geographers*, 44(1), 2-15.

3.4 Skills session 2

During this second skill session we will split the group in two. Based on your findings of the first skills session, each group will discuss how this workshop on ‘datafying non-humans’ has increased your skills in making productive analytical use of genres and framings in the context of the ‘data’ you are using in your own research.

3.5 Farewell & virtual group photo

Lecturers

Tahani Nadim is Junior Professor for Socio-Cultural Anthropology in a joint appointment between the Museum für Naturkunde Berlin and the Department for European Ethnology at Humboldt-Universität zu Berlin and a researcher at the Centre for Anthropological Research on Museums and Heritage. She heads the interdisciplinary research centre Humanities of Nature at the Museum für Naturkunde Berlin. She also runs the experimental research unit Bureau for Troubles in which she collaborates with artists and curators.

Claire Waterton: I am Professor of Environment and Culture within the Sociology Department at Lancaster University. My approach is to understand environmental problems as particular kinds of orderings in on-going natureculture relations. This helps us to open up questions about these relations, including how they came into being, as well as whether it is possible to create hopeful spaces for re-ordering them. In the last 20 years or so, I have had the opportunity of thinking through these issues using the theoretical tools of STS with many different scientists, policymakers and NGOs. I am interested in their ways of working, and in exploring whether we can work together in ways that might produce new ways of thinking about, and enacting, natureculture relations.

Christine L. Borgman is Distinguished Research Professor at UCLA and the author of more than 250 publications in communication, information studies, computer science, and law. These include three award-winning monographs from MIT Press: *Big Data, Little Data, No Data: Scholarship in the Networked World* (2015); *Scholarship in the Digital Age: Information, Infrastructure, and the Internet* (2007); and *From Gutenberg to the Global Information Infrastructure: Access to Information in the Networked World* (2000). At UCLA, she directs the Center for Knowledge Infrastructures. She has held visiting posts at Oxford, Harvard, Lund, DANS, Budapest Economic Sciences, and ELTE. Professor Borgman is a Fellow of the American Association for the Advancement of Science and of the Association for Computing Machinery.

Morgan Wofford is a Ph.D. student at the Information School at the University of Michigan. Previously, she received her MLIS at UCLA and worked as the Center for Knowledge Infrastructures' data analyst researching scientific data practices and policy, scholarly communication, and socio-technical systems. She currently works as a graduate student researcher for the NSF-funded Throughput Database studying data and software reuse practices and scholarly object networks.

David Ribes is associate professor in the Department of Human Centered Design and Engineering (HCDE) and director of the Data Ecologies Lab (deLAB) at the University of Washington. He is a sociologist of science and technology who focuses on the development and sustainability of research infrastructures (i.e., networked information technologies for the support of interdisciplinary science); their relation to long-term changes in the conduct of science; and, transformations in objects of research. His current research investigates the emerging institutions of *data science* at multiple scales, such as changing scientific practices, budding regional or national organizations and novel public-private partnerships. David is regular contributor to the fields of Science and Technology Studies (STS) and Information Studies. His methods are ethnographic, archival-historical and comparative. See davidribes.com or dataecologi.es for more

Sharif Islam (B.Sc Math and Computer Science, University of Illinois 2003, PhD Sociology, University of Illinois 2016) has more than ten years of experience working with large scale research computing and data infrastructures in the USA and Europe. He is currently the Data Architect for DiSSCo.

Clemens Driessen is a more-than-human geographer, working as an assistant professor of cultural geography at Wageningen University. In his work he seeks to extend notions of politics and culture beyond the human, by staging and interpreting ambiguous encounters with a variety of animals. Together with scientists, farmers, designers and other animals he has made a prototype video game for pigs to play with humans called 'Pig Chase'. More recently he tried to develop a more-than-human account of the origin of Cartesian thought in 17th century Dutch landscapes for the exhibition 'Countryside, the Future' at the Guggenheim Museum New York. With PhD students he is currently working on political landscapes shaped by habituated mountain gorillas in Uganda, wild boar on the Veluwe, historical ducks in the Netherlands, and wild geese in Helsinki.

About the coordinators

Anne Beaulieu is associate professor of Science and Technology Studies and director of the Data Research Centre at the University of Groningen. At Campus Fryslân, she works on creating knowledge infrastructures for sustainability and is responsible for the major Responsible Planet in the programme Global Responsibility and Leadership. She has co-edited the books *Virtual Knowledge: Experimenting in the Humanities and Social Sciences* and *Smart Grids from a Global Perspective*. She is the co-founder of the Groningen Energy Summer School for PhDs and acted as one of its scientific directors for 6 years. She is a member of the Board of Studium Generale Groningen and of the NIAS-Lorentz Advisory Board. Her book *A Critical Introduction to Data and Society* with Sabina Leonelli will appear in 2021.

Andreas Weber is an assistant professor in the research group of Science, Technology and Policy Studies (STePS) at the University of Twente. Most of his research and teaching examines the relationship between **Science, Technology and Culture (=STC)** from a long-term and global perspective. Andreas has a special interest in the history of natural history and chemistry in insular Southeast Asia and Europe. This includes research into how computational technologies can be used to increase access to and learn from biodiversity heritage collections gathered in former colonial areas. His research in the digital heritage domain also allows him to reflect upon how the growing use of computational technologies impacts research in the humanities, and, more generally, our understanding of culture and technology in society. Andreas holds a MA degree (2005) and a PhD, both from Leiden University (2012). In 2015-2016, Andreas was a John C. Haas fellow of the Science History Institute in Philadelphia. Andreas has also obtained a 1. Staatsexamen (=first degree in teacher's training to teach at German gymnasia) in History and German Language and Literature from the University of Bamberg (2006).

Participants

No.	First name	Surname	University/Organisation	What is the topic of your research (5 lines)?
1	Irene	Niet	Eindhoven University of Technology	My research concerns the public governance of AI applications in the (Dutch) electricity system. What does the technological development look like? What ethical and social consequences can this development have? How do or should we react to this?
2	Michiel	Bron	Maastricht University	My research focusses on the involvement of oil actors with the development of nuclear energy, from 1945 to 1985. The leading question is how different incumbents of the oil regime interacted with the emerging nuclear technology in the light of questions about the sustainability of fossil fuels in the long term.
3	Niko	Wojtynia	UU	Regenerative farming transition in the Netherlands
4	Markus	Rudolfi	Goethe-University Frankfurt am Main	Ethnography of transboundary conservation practices in a Czech-German context.
5	André	Brasil	Leiden University	In order to contribute to the continuous evolution of assessment practices of the Brazilian System of Research and Graduate Education, my research combines Scientometrics and Public Policy in order to upgrade the current evaluation model adopted, valuing the country's strengths while acknowledging and addressing its weaknesses.
6	Florian	Helfrich	University of Twente	Investigating the governance of techno-social transformations, examining the implementation of blockchain-based platforms and infrastructures for energy markets and local communities. It will be analysed how the technical construction and implementation of such infrastructures develop with relation to interactions and social relations between energy providers, governing institutions and local communities.
7	Lea	Beiermann	Maastricht University	My PhD thesis explores the history of microscopy in the late nineteenth century. I look at how people using microscopes on both sides of the Atlantic managed to work together despite their different backgrounds and different levels of scientific training. This question is gaining new relevance today, as a growing number of citizen science projects encourage lay participation in science, technology and medicine.
8	Chiara	Carboni	Erasmus University Rotterdam	The embedding of digital technologies in professional work and organizational structures in healthcare.
9	Xiaoyao	Han	University of Groningen	Value on Big data
10	Ivan	Veul	Radboud University	Google is often problematized as being too powerful, having unfair competitive advantages and as a privacy infringing surveillance company. In my research, I argue that the problems with Google might be best seen as a particular democratic problem: the current political configuration surrounding Google's data technologies insufficiently accomodates for the issues of publics. This builds on insights from STS and pragmatist political theory that show

				politics is not limited to traditional political institutions, but also occurs in companies and other organizations. I then consider what the situation of Google's data technologies looks like when problematized from this political perspective and how this lens might help us envision new solutions to the problems imposed by Google and other Big Tech companies.
11	Selen	Eren	University of Groningen	I am studying how bird ecologists create knowledge claims in contemporary knowledge infrastructures where the emerging and long-standing data collection and analysis techniques are used at the same time, as well as how to contribute to such knowledge infrastructures to make them more credible in a less positivist sense.
12	Joyce	Hoek	University of Groningen	My PhD research is part of the project Back to Bayesics: Solving the Replication Crisis in Biomedicine. My role in this project is an ethnographic study into the current practices of medicine approval.
13	Alicja	Ostrowska	Chalmers University of Technology	What is the definition of "life" in the context of AI? I investigate the definition of "life" in different contexts from a historical perspective. Furthermore, I study the role of technologies as AI and autonomous systems on the definition of "life" through ethnography in different contexts, on both macro- and microlevel, as warfare and bioscience.
14	Klara	Strecker	Eindhoven University of Technology	My research focusses on studying the sustainability of trade teleconnections between the global south and north. I am working on the Drivers of Sustainability (DOS) project, which looks into (un)sustainability developments of the flower supply chain connecting the Netherlands and Kenya from 1960 until 2020. I follow an interdisciplinary approach in studying complex global connections.
15	Jing	Wang	Radboud University	My research aims to understand how the notion of research quality is framed in different countries, and in the Chinese publication system in particular. The research is designed to investigate how journal quality is governed in China, which the following questions are include, how journal indicators become established, how journal indicators as a quality proxy are performed for various secondary aims, and how journal quality is challenged.
16	Rodrigo	Aután	Unicamp	The interdisciplinary challenges between social sciences and natural sciences, in an open-air laboratory in the Amazonian rain forest, dedicated to the analysis of CO2 concentrations and their possible natural and social repercussions.
17	Jackie	Ashkin	Leiden University	My research explores the relationship between (e)valuation practices and knowledge production in ocean science, (hopefully) examining scaling as a valuation practice. This research is part of the European Research Council project FluidKnowledge, lead by Prof. Dr. Sarah de Rijcke.
18	Mike	Grijseels	Vrije Universiteit Amsterdam	My research is on inclusive technologies. I study how we can use technology to improve inclusion of people with disabilities. For now I mainly focus on the workplace but other areas like education and health care might follow.
19	Annemarie	Horn	Vrije Universiteit Amsterdam	My research is about interdisciplinary collaboration among master student, and how they can be trained to collaborate effectively. Specifically we study how students can be facilitated in developing epistemic awareness and attitudes for knowledge sharing, understanding and

				integration. Moreover, how can their collaboration process be designed and implemented to facilitated synthesis of knowledge to a truly interdisciplinary end results?
20	Carla	Greubel	Utrecht University	My research studies how people think about and (try to) do 'good ageing' in and across three contexts: (1) the EU policy discourse on ageing and innovation, (2) a large scale implementation project of smarter living environments, and (3) the everyday lives of older people. I am especially interested in understanding the interrelations between these contexts and how some ideas about good ageing come to matter more than others.
21	Theocharis	Pсарos	University of Groningen	Title: Techno-science, Learning and Teaching: Exploring their Entanglement Under the Prism of Psychology, Purpose: To explore, from the perspective of Psychology, the impact of digital technologies on learning and teaching. Particular emphasis will be given on the issues of embodiment and materiality.
22	Caroline Anna	Salling	IT University of Copenhagen	Relations between big tech datacenters and district heating (hot water) infrastructures in Denmark. The excess heat (hot air) from the warm servers in hyperscale datacenters is being used for district heating in the effort of ending use of various forms of carbon fuels, while the electricity consumption of datacenters is increasing. My project is looking into the excess heat as a figuration between other kinds of excess, such as data and carbon particles emitted. The excess heat is being gifted (free of monetary value) from, for example, Facebook to the local municipality that owns the heating infrastructure. This thermodynamic exchange leads me to ask questions about datafication and digitalization of air and water.
23	Lea	Lösch	Vrije Universiteit Amsterdam (VU)	My PhD research centres around innovating the inclusion of values and experience-based knowledge in vaccination guidelines by using automated text analysis methods. It is part of a joint project between the Athena Institute of the Vrije Universiteit Amsterdam and the RIVM (National Institute for Public Health and the Environment).
24	Mischa	de Bruijn	University of Twente	Agricultural innovation, food system change, transition pathways.
25	Sarah	Inman	University of Washington	My thesis focuses on data synthesis for Wild Alaska salmon, a study that began through an initiative on acquiring, cleaning, and archiving data for Alaskan salmon research. My research looks at how a theory of nonscalability might illuminate issues of scale in ecology, and further, how Indigenous Alaskans and western scientists cooperate to produce knowledge about Wild Alaska salmon.
26	Hanna	Stalenhoef	Erasmus University	How does the discourse of regionalization takes shape in elderly care in rural areas?I approach the region both as a local contexts, which shapes the provision of care, and imaginaries which inspires normative ideas about good care, in order to map out how this concept influences how care for elderly people is provided, valued and accounted for.
27	Syb	Kuijper	Erasmus Universiteit	In the project we explore different components of nursing work, the valuation of the profession among both nurses themselves and other stakeholders and how these different socio-technical practices of valuation evolve and interact. Particular attention is paid to the context and dominant discourses in which the professionalization of nursing work takes place. We address prevailing norms, values, (situated) practices and how good nursing is enacted in (micro) social systems.

28	Kaya	Akyüz	University of Vienna	My dissertation is on the dynamics in the emergence of new research fields at the intersection of genomics/genetics and social sciences. I consider 'genopolitics' as a field-in-the-making with a complex pre-history. I analyze the battles over epistemic authority in the making and unmaking of genopolitics using regimes of knowledge production as a lens, where genetic and genomic data, how they are collected and used are in my focus.
29	Anneke	Boersma	VU Amsterdam	I'm gonna look into what the idea of the dietary shift (a shift towards a diet in which 80% of the protein is plant based and 20% animal-based) comes to be in different food consumption settings in India and in the Netherlands. It researches the transformations it might initiate within the healthcare system and the agricultural system.
30	Anne-Sofie Lautrup	Sørensen	IT University of Copenhagen	Carbon is increasingly becoming the measure used to understand and govern climate change. My research explores the role of carbon data in local understandings of Norwegian oil and gas production and negotiations over low-carbon futures. The empirical basis is ethnographic fieldwork in the Norwegian oil-capital Stavanger among young climate activists and people working in the local oil and gas sector.
31	Tessa	Roedema	VU	My PhD research is part of the EU-horizon2020 project 'RETHINK'. We study the (digital) science communication ecosystem, wherein we focus on sensemaking practices of citizens on science. Furthermore, we aim to contribute to constructive public discussions on science, by developing strategies for science communicators to make sensemaking practices more open & reflective.
32	Taylor	Craft	The University of Groningen	My research involves assessing the ecological integrity of grassland agricultural landscapes in terms of their suitability for Black-tailed godwit habitat. This involves an integrative framework that combines methods from the Earth Sciences, Technical Sciences, Ecology, and Agricultural Sciences. The emerging insights will be used to evaluate the sustainability of alternative agricultural production systems.
33	Monica	Vasile	Maastricht University, FASOS	My current project explores the history of reintroductions of endangered species, and I am part of the research group 'Moving Animals: A history of Science, Media and Policy in the 20th century'. My approach aims to integrate animals' biographies with a history of science and conservation, and I work on four case-studies: the Przewalski's horse, the black-and-white ruffed lemurs, the takahe, and the thick-billed parrot.

PhD Presentation guidelines

For presenters

- Send the title & summary of your presentation to the discussant assigned to you at least 1 week before the workshop.
- A projector and PC are available. Copy your presentation onto the PC in advance. You may want to use your own laptop, which usually works fine, but mind that it poses an extra risk of technical issues. Also, if you have video material, make sure you have it downloaded locally. There is internet, but relying on YouTube etc. is risky.
- The duration of your presentation should be **15 minutes**. Then there is another 15 minutes for the discussant and plenary discussion. We keep time very strictly.
- Try to make a sophisticated choice on what you want to present. One typical pitfall is wanting to give an overview of your whole PhD project, which leads to an unfocused and overloaded presentation. Rather select an interesting aspect of your research and discuss it in-depth.

For discussants

- Make sure you receive the title & summary of the presentation at least 1 week before the workshop. Contact the presenter if needed.
- After the presentation: join the presenter in the front of the room
- Present your comments in **5 minutes** max.
- Mind that being a discussant is not about pointing out all the flaws in the presenter's argument, but about setting the stage for a constructive discussion. Offering critique is good, but also try to bring out what the potentials of the argument are for improvement, and to identify some questions for the speaker or the group as a whole.
- You may want to get in touch with the presenter to prepare some comments. Feedback should address the quality of the presentation itself (slides, clarity, focus) as well as its content.

All others

- Listen carefully and attentively to the presentation.
- Join the discussion after the discussant has given their feedback.
- Chances are that there is not enough time to discuss all questions from the audience. Please write them down on the feedback form. Even without discussion, your questions might be very valuable for the presenter!

Feedback on Presentations

This is to help you give feedback to your fellow participants, some of whom will be presenting their research during this event. Feedback forms will be available at Soeterbeeck. Use a separate sheet for each presentation, put your name and that of the presenter at the top of a piece of paper. That way, if something isn't clear, the presenter knows whom to ask. Write your comments during or immediately after the presentation and give them to the presenter during the next break.

Points to consider when preparing feedback (you don't need to cover everything):

- Attractiveness of title and opening
- Clarity and significance of problem definition, research questions and aims (refinement of, addition to, clarification or rejection of an existing thesis)
- Use of theory and/or historiography (concepts, interpretations, etc.)
- Embeddedness in fields relevant to WTMC
- Clarity of structure
- Presentation of the method(s) employed
- Validity and reliability of the method(s) employed
- Accessibility of the research data to the audience
- Use of (intriguing and relevant) details and examples
- Clarity of argument
- Relation to the nature and level of expertise of audience
- Use of PowerPoint and other audio-visual resources
- Contact with audience and audibility of speech
- Clarity and significance of conclusions
- Response to questions and comments
- Time management

