Digital Studies of Digital Science

Welcome to DS² 2021!

Our aim in hosting this meeting is to bring together scholars working on two separate trends. First, *the products of science themselves have increasingly become digital* Ð from big data produced in laboratory contexts to the increasingly dominant roles of social media and preprints in the dissemination of results. Second, *the methods that we use to study those products have also become digitized* Ð scholars including philosophers, historians, linguists, and sociologists have turned to tools like network and citation analysis, textual analysis (and other tools of the digital humanities), and modeling and simulation, in our attempts to understand science and its changes over time. Both of these shifts have made a substantial impact on the epistemic landscape of science, and are in the process of reshaping the philosophy of science in particular and science studies more generally.

What has been lacking, we think, is the opportunity for dialogue between these two groups of researchers. On the one hand, meta-level claims about digital methods in science should equally well apply to cases where these methods are used in the humanities. And conversely, those interested in the epistemic characteristics of these digital methods in general should be able to learn from instances of their application in the humanities as well. We thus hope to put these two groups in dialogue, looking for new insights and modes of research enabled by our digital study of digital scientific products.

Registration

Watch the videos after the event

The meeting took place (freely available online), from March 15Ð18, 2021, hosted on Crowdcast. Videos of the talks (if the presenter agrees) are now available on the YouTube page for the CEFISES center at UCLouvain.

You can find social media posts about the conference under the hashtag #DS2conf.

Accessibility

While we donÕt have access to a live closed-captioning service for the streaming platform weÕre using, we will be processing all talk videos through the Otter transcription service, and the videos that we post on YouTube will include these captions. We will encourage any speakers who choose to pre-record their video to supply us with transcriptions for that content as well.

Program

All times are listed as they took place in Brussels time (CET).

March 15

☐ 14h00Ð14h30: ☐ Conference introduction and logistical information

Charles Pence and Luca Rivelli (UniversitŽ catholique de Louvain) ☐@pencelab ☐@pencechp

14h30Ð16h00: ☐ ÒEnvisioning digital scienceÓ

Keynote: Katy Bšrner (Indiana University) ☐@katycns

In the information age, the ability to read and make data visualizations is as important as the ability to read and write. This talk explains and exemplifies the power of data visualizations not only to help locate us in physical space but also to help us understand the extent and structure of our collective scientific knowledge, to identify bursts of activity, pathways of ideas and products, or emerging areas of research and innovation. It introduces a theoretical visualization framework meant to empower anyone to systematically render data into insights together with tools that support temporal, geospatial, topical, and network analyses and visualizations. Materials from the Visual Analytics course (https://visanalytics.cns.iu.edu) and science maps from the Places & Spaces: Mapping Science exhibit (http://scimaps.org) will be used to illustrate key concepts and to inspire participants to visualize their very own data.

Prof. Bšrner is the Victor H. Yngve Distinguished Professor of Engineering and Information Science and the Founding Director of the Cyberinfrastructure for Network Science Center at Indiana University.

☐ 16h05Ð16h50: ☐ ÒThematic evolution of human genome researchÓ

Cody O'Toole, Ken Aiello, Michael Simeone, and Manfred Laubichler (Arizona State University) ☐@kenaiello ☐@michael_simeone

☐ 17h00Ð17h45: ☐ ÒThe rise of epigenetics and the neglect of transposon dynamics across disciplinesÓ

Stefan Linquist and Brady M. Fullerton (University of Guelph)

☐ 17h50Ð18h35: ☐ ÒUnderstanding masking in scholarly data publishing and reuse: An exploratory study of practices relating to obscurities in archaeological dataÓ

Olle Skšld, Lisa Bšrjesson, and Isto Huvila (Uppsala University) ☐@CAPTURE_ERC

☐ 18h45Ð19h30: ☐ ÒMachine learning and the scientific method: the case of the Free Energy PrincipleÓ

Mel Andrews (University of Cincinnati) ☐@bayesianboy

☐ 19h35Ð20h20: ☐ ÒDigital humanities and the philosophy of mathematical practiceÓ

Henrik Kragh S¿rensen (University of Copenhagen) ☐@hkraghs

March 16

14h00Ð15h30: ☐ ÒTopic-modeling of multilingual non-parallel corpora: Applying machine-translation to a philosophy of science corpusÓ

Keynote: Christophe Malaterre (UniversitŽ du QužbecˆMontržal) ☐@ChMalaterre

Topic modelling is a well-proven tool to investigate the semantic content of textual corpora. Yet corpora sometimes include texts in several languages, making it impossible to apply language-specific computational approaches over their entire content. This is the problem we encountered when setting to analyze a philosophy of science corpus spanning over 8 decades and including original articles in Dutch, German and French, on top of a large majority of articles in English. To circumvent this multilingual problem, we propose to use machine-translation tools to bulk translate non-English documents into English. Though largely imperfect, especially syntactically, these translations should nevertheless provide correctly translated terms and preserve the semantic proximity of documents with respect to one another. To assess the reliability of this translation step, we develop a Òsemantic topology preservation testÓ that relies on estimating the extent to which document-to-document distances have been preserved during translation. We then conduct an LDA topic-model analysis over the entire corpus of translated and English original texts, and compare it to a topic-model done over the English original texts only. We thereby identify the specific contribution of the translated texts. These studies reveal a more complete picture of main topics that can found in the philosophy of science literature, especially during the earlier periods of the discipline during which numerous articles were published in languages other than English.

Prof. Malaterre is Canada Research Chair in Philosophy of the Life Sciences and Professeur in the Džpartement de philosophie at the UniversitŽ du QuŽbec ˆ MontrŽal.

◻   15h35Ð16h20: ◻ ÒAcknowledgments Co-Mention Networks: A new method for mapping the social structure of scholarly fieldsÓ

Eugenio Petrovich (Universitˆ degli Studi di Siena) ◻@EugenioPetrovi1

◻   16h30Ð17h15: ◻ ÒA computational analysis of interdisciplinary model template transferÓ

Maximilian A. Noichl and Andrea Loettgers (University of Vienna) ◻@MaxNoichl ◻@AndreaLoettgers

◻   17h20Ð18h05: ◻ ÒFrom the archive to a computational, conceptual map: a distant reading of *Biometrika*Ó

Nicola Bertoldi (UniversitŽ du QuŽbec ˆ MontrŽal / UniversitŽ Paris 1-Sorbonne)

◻   18h15Ð19h00: ◻ ÒSuper-vision: Celebrating the 50th EPFL Anniversary Through the History of 8,000 Doctoral ThesesÓ

Dario Rodighiero (Harvard University) ◻@dariorodighiero

◻   19h15Ð: Virtual Exhibit Tour and Social Hour (Zoom)

Places & Spaces: Mapping Science Project (Indiana University) ◻@mappingscience

Join us for a virtual Zoom hangout to explore the Places & Spaces project at Indiana University. WeÕll start with a thirty minute Òguided tourÓ of the exhibition, then youÕll have a link available to browse through at your own pace and some members of the project team will be available to answer your questions. Stick around (and grab a timezone-appropriate beverage) to chat with other conference attendees and presenters in Zoom breakout rooms.

March 17

14hÐ15h30: ◻ ÒLanguage and the Construction of Knowledge in the Scientific CommunityÓ

Keynote: Susan Hunston (University of Birmingham)

The distinctive language of scientific discourse has been shown to underpin the processes of knowledge construction and transmission. This paper focuses on two concepts that are key to the investigation of scientific discourse: that of grammatical metaphor (developed by Halliday); and that of epistemic status (developed by Hunston). These concepts not only contribute to accounts of what might be called the scientific style, but also elucidate how knowledge is constructed communally. The early qualitative research behind these concepts has been corroborated by more recent quantitative studies such as those by Biber

and Hyland. The paper also examines contexts where the language of science is placed under pressure by the need to address and intersect with other communities. The particular cases discussed are the popularisation of science for lay audiences and the challenge to science presented by interdisciplinary research involving both natural science and social science.

Prof. Hunston is Professor of English Language in the Department of English Language and Linguistics at the University of Birmingham.

⬜ 15h35Ð16h20: ⬜ ÒAcademic status in a digital age: invisible barriers to Open ScienceÓ
Hugh Desmond (CNRS / UniversitŽ Paris 1-Sorbonne)

⬜ 16h30Ð17h15: ⬜ ÒExplaining ambiguity in scientific language: towards a computational approachÓ
Beckett Sterner and Ankush Tale (Arizona State University) ⬜@beckettws

⬜ 17h20Ð18h05: ⬜ ÒAcademic Twitter, social media practices, and the enactment of contemporary academic workÓ
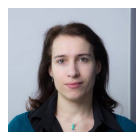Sarah R. Davies (University of Vienna)

⬜ 18h15Ð19h00: ⬜ ÒDigital interdisciplinarity: metadata as a source for the historiography of scholarship in the Holy Roman EmpireÓ
Stefan He§brŸggen-Walter (HSE University) and Jšrg Walter (Independent Scholar) ⬜@FrueheNeuzeit

⬜ 19h05Ð19h50: ⬜ ÒPhilosophical reasoning about science: a quantitative, digital studyÓ
Moti Mizrahi (Florida Institute of Technology) and Michael Dickinson (University of Illinois) ⬜@motimizra

March 18

14hÐ15h30: ⬜ ÒRethinking HPS through digital studiesÓ
Keynote: Sabina Leonelli (University of Exeter) ⬜@SabinaLeonelli

This talk will start with a reflection on lessons learnt from studying the impact of digital technologies and related methods on the natural sciences, and particularly data-intensive biology, biomedicine, crop and environmental science, as well as recent research on the pandemic crisis. It will then consider what implications such lessons have for the history and philosophy of science (HPS). Such lessons range from HPS conceptions of accountability to the choice of methods and instruments, the ways in which evidence is produced and displayed, the means chosen to communicate and validate research, and who is engaged as prospective collaborator or public for HPS work.

Prof. Leonelli is Professor of Philosophy and History of Science, and the Co-Director of the Exeter Centre for the Study of the Life Sciences (Egenis) at the University of Exeter.

◻   15h35Ð16h20: ◻ ÒBig data in behavioural biologyÓ
Rose Trappes (Bielefeld University) ◻ @RoseTrappes

◻   16h30Ð17h15: ◻ ÒCrises, causes, and cures: a digital analysis of psychologyÕs recent crises and the allure of Open ScienceÓ
Tabea Cornel and Brandon Heil (New College of Florida)

◻   17h20Ð18h05: ÒWhat empirical network analysis could offer to research in Integrated HPSÓ
Catherine Herfeld (University of Zurich) ◻ @cherfeld

◻   18h15Ð19h00: ◻ ÒCloseness and betweenness centralities for multiplexes and their #GraphPoem applicationsÓ
Chris Tanasescu, Nicolas Burny, Jean Vanderdonckt (UniversitŽ catholique de Louvain), Diana Inkpen, and Vaibhav Kesarwani (University of Ottawa) ◻ @MARGENTO_ ◻ @jeanvdd

◻   19h05Ð19h50: ◻ ÒOpen science canÕt solve the replication crisisÓ
Daniel Hicks (University of California, Merced) ◻ @danieljhicks

◻   19h50Ð20h00: ◻ Conference closing
Pence & Rivelli

Thanks

Thanks to our presenters, our extremely gracious keynote speakers, our technical support team, and above all, to the FNRS (Fonds de la Recherche Scientifique) for financing the conference (under grant no. F.4526.19). A special note of appreciation as well to the group from the BSHS which recently ran an extremely successful online conference and shared their best practices, particularly Sam Robinson and Emma-Louise Hill, as well as the other authors on their extremely illuminating BJHS article, from which weÕve drawn several important notes. (ItÕs very much worth a read, if you get the chance!)

Other Information

- DS²: Synthese Topical Collection
- DS² 2021: Info for Speakers
- DS² 2021: Call for Papers