Editorial Introduction to "Digital Studies of Digital Science"

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The practice of contemporary science has been significantly and undeniably altered by two trends which have largely been considered separately by the literature in philosophy of science and science studies. First is the fact that *the products of science have increasingly become digital.* From big data produced in laboratory settings (Leonelli 2016) to the increasingly dominant roles of social media and preprints in the dissemination of results (Kraker et al. 2015; Guédon et al. 2019), scientific knowledge is increasingly itself created, expressed, and transmitted via digital means. Repositories of experimental data and custom software used by scientists for data processing are regularly cited as ways to improve the reproducibility of scientific results (Munafò et al. 2017). Digital visualizations are not only useful tools, but become mandatory when the scope of scientific research surpasses the ability of researchers to present their results in any other way (or even to monitor the progress of their experiments; see Avolio et al. 2017).

The second trend – at least in part interpretable as a response to the first – is that *the methods that we use to study those products have also become digitized.* Scholars including philosophers, historians, linguists, and sociologists have turned to tools like network analysis (including citation networks; Zhao and Strotmann 2015), textual analysis (and other tools of the digital humanities; Pence and Ramsey 2018; Lean, Rivelli, and Pence 2021), and modeling and simulation (Aydinonat, Reijula, and Ylikoski 2021; Bruner and Holman 2019; Zollman 2012). These efforts have enabled us to supplement our traditional tools of close reading and the analysis of scientific practice with large-scale approaches that facilitate the "distant reading" (Moretti 2003) of the processes and products of the scientific community. They are, at least according to some, reshaping the humanities as a whole (McGillivray et al. 2020), and science studies is no exception.

Of course, one might simply see these as two among the manifold facets of the digitization of the rest of the modern world: the same trend can be seen in every corner of contemporary life. But we believe that such a dismissal would be short-sighted. The ways in which both of these trends have made an impact on the epistemic landscape of science – whether at the first-order level or at the meta-level – are replete with echoes of the same underlying themes concerning the nature, epistemology, and use of digital methods. However, despite this resonance, the opportunity for dialogue between these two groups of researchers has largely been lacking. Meta-level claims about digital methods in science should equally well apply to cases where those methods are used in the humanities – best practices are best practices, and potential failings, shortcomings, or openings for abuse will likely translate as well (Pence 2022). And conversely, humanists interested in the way that digital methods have reshaped the sciences may need to turn to digital tools themselves in order to take account of the breadth, scope, and pace of this rapid change in the scientific community.

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To encourage precisely this dialogue, we hosted an online conference, Digital Studies of Digital Science (DS²), from March 15–18, 2021.[2] This meeting brought together scholars in philosophy of science, history of science, scientometrics, science studies, philosophy of mathematics, data visualization, corpus and computational linguistics, sociology, literature, and the history of philosophy (to name only a representative sample). Our keynote speakers explored the future of digital history and philosophy of science, the use of language in scientific knowledge construction, the challenges of studying multilingual scientific corpora, and approaches to visualizing the data thus generated. We also hosted a virtual visit from the Places & Spaces interactive exhibit at Indiana University, an effort to map science at the frontiers of digital art and science studies.

Some of the articles in this topical collection were presented at the conference, while others were submitted in response to an open call for papers. We hope that their diversity in both discipline and content, their high quality, and the broader perspectives that they encourage serve as an ample demonstration that there is indeed fruitful work to be done at the intersection of these two fields of digital study, and that philosophers of science should pay special attention to this ongoing revolution in scientific and humanistic methodology.

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Conflict of Interest

The authors have no relevant financial or non-financial interests to disclose.

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