

Editorial

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Visual tools and instruments have been a focal point of historical, social and cognitive studies of science for quite some time, and even more so with the onset of the digital era. Profound questions about the nature of scientific knowledge are posed by the plethora of digital images and computational visualizations to be found in scientific domains. Currently, we are seeing the emergence of a new generation of computational and digital tools which are fast becoming entrenched in all research domains across science, social science and the humanities, and which are even constitutive of new cross-cutting domains. It remains unclear which distinctions become important now that the predominant form of picturing is *computational* or in what specific ways this makes a difference.

In order to explore these questions, we organized a conference titled *Visualization in the Age of Computerization* held in March 2011 at Oxford University. The response was overwhelming. There was clearly a broad and interdisciplinary interest in taking a step back to focus on the increasingly everyday tools of our trades. Equally manifest, and fittingly, was how emergent technologies are attracting a new generation of scholars bringing novel insights, unique scholarly networks and empirical case studies to re-cast our understanding of the use of visualization in the sciences and humanities. This issue of *ISR* gathers a selection of the papers that were presented at the conference and that attest to the richness of the burgeoning studies of computational visualization as a mediator of knowledge and material practices across the academy. Although research is increasingly mediated by computational visualizations, these visualizations are becoming topics of interest in their own right, and are currently being researched from a wide variety of nuanced perspectives. For the reader, the papers of the issue may be approached like nodes of an expanding network of visualization scholars; offering entry points that connect a diversity of fields and flag paths for further reflection and future research. Amongst other fields, the papers assembled here include anthropology, cognitive science, communication

studies, criminology, interactive art and technology, Internet studies, philosophy, sociology, and science and technology studies.

Attention to the new range of computational tools for imaging and visualizing in current research is changing the landscape of science studies in different respects. First, the pervasive use of digital images and computational visualizations institutes new modes of practice and new forms of collaboration in existing, traditional disciplines, demanding a re-assessment of how technology-mediated knowledge operates in these domains. Second, computational means of picturing not only foster innovation in science but also innovation in our analytic tools for understanding science, its practices and its role in society, including the understanding of controversies about science, often relating to emerging innovations which are themselves highly technologized, such as biotechnology, synthetic biology, nanotechnology, social media, new forms of online sociality, and surveillance technology. Third, these new computational means for handling and managing knowledge and information have given rise to new fields such as science visualization, information visualization, visual analytics and webmetrics. Finally, ethnographic and reflective attention to the mediation of knowledge crafted with new computational tools raises ontological questions. For instance, are associations of scholars with new technological infrastructures enacting novel objects of knowledge?

To varying degrees, all of these points are taken up by the selection of papers in this issue. The papers treat the use of computational means of picturing in a wide array of established scientific disciplines: forensics (Kruger), astronomy (Murillo, Gu, Guillen, Holbrook and Traweek), musicology (Eden, Jirotko and Meyer), and physics (Spencer); they explore the analytic capacities for web-based visualization for understanding public controversies (Madsen), and also make use of visualizations as an analytic tool for showing up the social and political aspects of science alongside the study of visualizations used by scientists (Murillo); and they investigate the assumptions underlying the new visualization sciences, in visual analytics (Aries-Hernandez, Green and Fisher), in information visualization (Madsen), and in digital archiving (Eden, Jirotko and Meyer).

As is clear from all the papers gathered here, computational visualizations raise profound methodological and theoretical challenges.

In particular, a shift away from representational accounts is a general trend in many of the papers. Although this shift has already been evident for some time in science and technology studies and visual studies generally, an important question is whether the new generation of computational picturing in all its forms gives the last push to representationalism in favour of more dynamic and relational approaches to tackle the intricate relations between technology, perception, knowledge and society.

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