Introduction to the *DHQ* Special Issue: Digital Technology in the Study of the Past

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Abstract

This is the guest editors' introduction to the *Digital Humanities Quarterly* special issue on Digital Technology in the Study of the Past.

Introduction

Digital technology is transforming the assemblage and dissemination of historical information. Museums, libraries, archives, and universities increasingly modify their digital research infrastructures in order to make data open and available (see [Crane, Seales, and Terras 2009]; [Smithies 2014]; [Terras, Nyhan, and Vanhoutte 2013]; cf [Foka et al. 2017]). The imminent assessment and representation of historical data has admittedly challenged the boundaries of historical knowledge and generated new research questions [Drucker 2013] [Nygren, Foka, and Buckland 2014] #nygren2016 [Westin 2014] #westin2015 [Chapman, Foka, and Westin 2016] [Foka and Arvidsson 2016]. The process of reconstructing, visualizing and rendering historical data has equally developed together with technology [Westin, Foka, and Chapman 2018]. This is the case in both academic and heritage contexts and in less immediately obvious popular uses, such as the increasingly significant presence and use of history within videogames [Chapman 2016]. Regardless of specific context, as this collection of articles shows, the process of digitally capturing and representing historical data is often analogous to and determined by the digital platform used.

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Scientific visualisation emerged in the fifteenth century as an important method through which to record, to transport findings by turning them into inscriptions that could be then shared and analysed [Latour 1990, 6]. Digitally reconstructing is the active part of what has been termed as a "knowledge representation" [Favro 2006] [Dunn et al. 2012]. This is in effect "a visual manifestation of the physical and digital archive documentation, and a process of knowledge acquisition and evaluation", with visualizations and reconstructions composing a research method and a series of questions - a process of extracting information while simultaneously developing a model [Westin and Claesson 2017, 116–129]. Reconstructions are occasionally "frowned upon as inherently inauthentic imitations of real monuments, i.e those that have survived the test of time" [Silberman 2015, 2] (cf [Westin and Claesson 2017, 116–129]). While the ocularcentric tradition of visual cues is dominant within humanities research [Howes 2005, 14] [Classen 1997, 401–12] more immersive platforms open up new sensory possibilities. It is commonly believed that intangible artefacts, such as dancing or soundscapes for example, leave no traces or evidence, meaning they cannot be reproduced in their entirety (see [Foka and Arvidsson 2016]). However, this special issue argues that the lack of evidence is in fact present in any historical research, sensory or not, as western intellectual tradition has shown a marked preference for vision as the figure of knowledge (see [Evens 2005, ix]).

2

First conceived at the international conference *Challenge the Past / Diversify the Future*[1], individual contributions examine both the opportunities and challenges that digital technology poses in the study and dissemination of the past. Five articles focus on the processes that lead to visualizing/rendering intangible historical data within the disciplines of

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classical studies, environmental archaeology and historical science more generally. "Intangible" is often defined by large initiatives (UNESCO) as the term that replaced "folklore" as referring to aspects of cultural heritage that are non-physical, estimated, incorporeal, unembodied, and disembodied. In this special issue, in using the term *intangible*, unless otherwise stated, we mean the historically invisible or complicated to render by digital means, the incomplete and the intangible in cultural or environmental, social or ecological terms.

Beyond reconstructions, and because of innovative digital tools, visualizations/renderings for historical disciplines can, more generally, vary from simple graphs to word clouds and geospatial, time-interactive maps. Early digital visualisations have accordingly provided insight into aspects of urban development and have facilitated critical discussions of the application of digital tools within the context of museology, conservation, urban planning, or the narratives of digital heritage [Vitale 2016]. Early digital visualizations also made evident how existing digital tools and related models carry assumptions of knowledge as primarily visual, thus neglecting interactivity with the user/observer or, for example, sensory data. As it emerges from this special issue, current technological developments, such as augmented, mixed, or even virtual reality, can inspire new modes of representation that call for new scientific questions and methods/solutions.

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Joshua L. Mann's paper, *How Technology Means: Texts, History, and Their Associated Technologies,* begins from the premise that technologies used to study and represent the past are not hermeneutically neutral: the main question that the author aims to explain relates to the ways in which associated technologies convey meaning. Mann examines textual history, using biblical texts as a case study. The thrust of this study is that older, future and contemporary textual technologies may capture or obscure material history. The author examines and compares the non-digital book and its familiar digital counterparts. Further, the article considers ways in which augmented reality and virtual reality have already been used and might be used in future to render historical texts. New technologies then appear to trespass the boundaries of previous book technologies in capturing a text's history. In conclusion, the author makes practical suggestions in relation to reading, studying, or producing digital textual objects.

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Helen Slaney, Anna Foka and Sophie Bocksberger's piece, *Ghosts in the Machine:a motion-capture experiment in distributed reception*, similarly tackles the question of digital reconstructions of classical antiquity as the "sensory turn" in historical scholarship moves beyond vision. The article concentrates on kinaesthesia, or the sense of self-movement in Roman Pantomime. The article concludes that kinaesthetic engagement can also contribute to formulating conceptions of the ancient past, and that virtual reality is "an ideal tool for fashioning this analogical relationship". The objective is recreating Roman Pantomime to examine how the dancers' kinaesthetic translation of ancient data pertaining to *orchēsis* would be affected by the additional factor of digital interaction. Motion Capture and the creation of 3D avatars of the dancers is discussed thoroughly, while resulting videos enable each dance piece to be analysed from any angle in the context of a virtual ancient theatre environment. The authors conclude that this experiment inspired both questions of a humanistic and of a technological nature.

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Eleni Bozia's *Reviving Classical Drama: virtual reality and experiential learning in a traditional classroom* discusses how a scholar and a student are to perceive Classical Drama, the theatrical place, the distances between the actors, the chorus, and the audience, the logistics of the performance, and the cultural aspects at play. Bozia advocates the use of mixed reality as a way to promote experiential learning. Mixed reality promotes traditional edification methods, virtually recreating a stage, with the Magic Mirror Theater, a web application designed to help students understand Classical Drama. The author first makes an account of all the attempts at reviving the circumstances of performance in the actual physical place; then it discusses a mixed-reality environment as an ideal solution for the study of ancient drama, allowing the user to "be" in the theatrical space, and experience the performance.

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Claudia Sciuto, in *Recording invisible proofs to compose stone narratives*, focuses on how the history of human-environment interaction is embedded in stone. Sciuto discusses how the intangible life story of an artefact is partially registered in its primary material properties and its physical alteration from contact with other bodies. The article concentrates on two methods: chemical imaging and portable spectroscopy; these quick and non-destructive remote sensing techniques can be used to collect empirical data and track production and use of stone artefacts over time. With the Mobima project carried out by an interdisciplinary team of archaeologists and chemists at University of Umeå,

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Sweden as a case-study, the author first reviews Near Infrared Spectroscopy as a method for geochemical characterization of stone artefacts and as a tool for provenance studies. The author concludes by making an account of archaeometry as a new method with multiple purposes, from rock paintings to medieval stone walls to soil composition and pedagogical training. The digital tools have been adapted to the specific purpose of each study, offering reliable support for understanding geologic materials and their context.

Finally Philip I. Buckland, Nicolò Dell'Unto and Gísli Pálsson's contribution, *"To tree, or not to tree"?: On the Empirical Basis for Having Past Landscapes to Experience*, provides an overview of some of the complex issues involved in reconstructing and visualizing past landscapes. Empirical data, as the authors argue, creates the need for humanistic terminology that is borrowed by the natural sciences. The authors analyse this from the perspectives of environmental archaeology, archaeological theory and heritage management as well as relating this, briefly, to the broader context of archaeological theory, practice and research data infrastructure. The article provides a point of reference for those examining past landscapes, understanding their relevance in archaeological visualisation. |9|

Taking into consideration that the process of digitally rendering the past, indeed, ought to be documented, explicit and transparent in order to be scholarly validated [2], all contributions describe and analyse the thought processes and further activities around conceptual rendering methods they have used within research projects. Contributions here discuss the complexities of landscape studies (see Buckland et al. in this issue); how provenance tracked and visualized may reveal past conditions and uses of stone artefacts (see Sciuto in this issue); how the sensory may be re-experienced and reflected upon within a virtual reality Roman pantomime performance (see Slaney et al. in this issue); how conceptual 3D renderings may be further implemented as an experiential learning tool in the classroom (see Bozia; Slaney et al. in this issue); and the possibilities that new technologies may open for the study of old texts (see Mann on biblical texts). Individual contributions here focus precisely on interactive and embodied renderings of the past, including attempts to experience the past rather than just gaze upon it (see Slaney et al; Bozia in this issue). New forms of digital ekphrasis (see #lindhé2013) are shaped with technology, making technology "good to think with", to paraphrase Levi Strauss. Visualizations appear affected by our interpretative choices concerning the (often incomplete) data at hand and digital technologies with limiting rendering capacities. |10|

Contributors and editors agree that regular and canonised assessment of the processes of visualization/rendering the past is deemed pivotal for any scholarly activity [Vitale 2016]. Visualizations evidently can lead to novel epistemological questions through the process of making, the real-life applications for pedagogical and public dissemination purposes, and the feedback on what technology can and cannot do at this moment. This collection of articles then, rather than concentrating on the properties of digital representations as such, encourages historians to think in terms of transduction, the conversion of energy from one form to another. Ultimately, new possibilities can be found for creative research and expressions which integrate affective history with more traditional modes of understanding [Turkel 2011]. To grasp the importance of how technology may interrupt the flow of information, the following articles target visualizations in order to discuss technology as fragmented in its mediation of an already fragmented past. In this light, the ultimate aim of this collection is to reflect upon the validity of technology as a digital research infrastructure for the humanities where ideas may be *realized*, communicating the past to a large and diverse audience and inspiring new questions in the process of making. With this issue we aim at foregrounding the role of digital, historical visualizations. This research strand takes as its starting point the digital as a resource to formulate a critique of our understanding of the past. |11|

Notes

[1] The conference was funded by Riksbankens Jubileumsfond and was a collaborative effort of the Department of Conservation and the Centre for Digital Humanities (University of Gothenburg), Visual Arena in Gothenburg, as well as Humlab, the Digital Humanities Laboratory at the University of Umeå. The event was hosted by the Centre for Critical Heritage Studies at the University of Gothenburg.

[2] [Vitale 2016, 147–68]

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