Expanding the Boundaries of Digital Scholarship:
Publication and Peer Review of 3D Scholarly Editions

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3D technologies for the digitisation, modelling, and simulation of data are being widely used in fields including heritage, history, archaeology, architecture, forensics, and engineering. However, the challenges of publishing 3D outputs as autonomous works of scholarship that are recognised and rewarded similarly to more traditional paradigms have been insufficiently addressed. On the one hand, such scholarship does not often follow robust methodological standards and exists in a rapidly developing and thus fragile technological ecosystem. On the other hand, 3D scholarship exists in a bifurcated information space: the knowledge generated from the models is published in articles, while the models rarely become available to the scholarly community and/or a more general audience in a meaningful, informed, and contextualised manner; 3D models are presented in a void, with no or very little historical, cultural, and social narratives that justify the value of this scholarship; therefore, they function as illustrative figures and do not make visible the scholarship that has gone into their creation (e.g., sources, decision-making, and methodologies). In addition, infrastructures and systems that provide robust workflows for publication and peer-review of this scholarship barely exist. As a result, 3D scholarship is still at a transitional phase; even though more scholars and institutions embark into the development of 3D-based research (e.g., in the context of EU directives and the development of the European Space for Cultural Heritage), there are insufficient theoretical, methodological, and technical frameworks to support, recognise, and reward it.

Addressing these challenges, our previous work (Schreibman and Papadopoulos, 2019; Papadopoulos and Schreibman, 2019) advocates for the establishment of a framework in which 3D cultural heritage objects are published in the form of 3D Scholarly Editions. As Sahle (2016) has argued, Digital Scholarly Editions do not have to be restricted to literary texts, but rather 'cover all cultural artefacts from the past that need critical examination in order to become useful sources for research in the humanities' (p. 22). In 3D Scholarly Editions, the 3D models essentially become the text of conventional publication paradigms. This is done by means of contextualisation with multiple types of source materials, (e.g., annotations, images, video, structured/unstructured data) and the documentation of metadata and paradata, providing users with access to modelling and interpretative choices as well as scholarly arguments; thus, creating a multimodal resource impossible to replicate in print form.

The Dutch research infrastructure, PURE3D (funded by Platform Digitale Infrastructuur - Social Sciences & Humanities), currently in the last stages of its development, is establishing a framework in which 3D scholarship will be published and preserved in the form of 3DSEs. The goal of these editions is to move beyond how we typically interact with 3D models online as merely interactive digital representations of their physical counterparts, to models that exist within a knowledge site; what Derrida (Derrida and Prenowitz 1995, 10) and the earliest textual editors of web-based scholarship called the archive, what Deleuze and Guattari (1987, 4) called an assemblage, in which the textual and contextual are interwoven within the same viewing environment (Gabler 2010, 46), thus providing an environment for the communication of 3D scholarship that shares the same

intellectual rigour as more traditional, text-based editions. However, for 3D content to take its place as a scholarly output, it must be subject to typical processes of publication and peer review.

Journals and publishers have been experimenting with conceptual and technical systems for the publication and peer review of multimodal interactive scholarship (e.g., Journal of Digital History, Melusina Press, Stanford Digital Projects, Manifold, Digital Scholar, Quarto). Such formats challenge the scholarly publication ecosystem in their FAIRness, recognition, and sustainability. Concurrently, peer review, the main vehicle for validating and improving academic work, is being questioned (Hunter, 2012; Köhler et al., 2020; Harms and Credé, 2020; Heesen and Bright, 2021) due to issues of transparency and anonymity; the challenges of reviewing software and datasets; and the complexities of interactive, collaborative, digital scholarship (Risam, 2014; Schreibman et al. 2011; Nyhan, 2020). Drawing from such attempts and considering the conceptual and methodological complexities that the evaluation and publication of such scholarship brings, PURE3D – through the NWO Open Science grant for OPER3D – aims to provide an open and transparent publication and peer-review, ultimately becoming a quality assured infrastructure that will enable the recognition of 3D Scholarship on a par with more traditional research outputs.

Our presentation draws on a mixed-methods approach, including surveys, interviews, focus groups, and use case analyses, to explore the challenges and opportunities in publishing 3D scholarship. By situating our findings within broader initiatives aimed at reforming research assessment (e.g., DORA, CoARA, Recognition and Rewards), we aim to contribute to the ongoing discourse on enhancing the visibility, credibility, and impact of 3D scholarly works.

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