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Digital Art History at the Crossroads[x]

A digital *Nachleben* for Panofsky?

The title of this essay pays homage to one of art history's most influential texts, Erwin Panofsky's *Hercules am Scheidewege*.[1] That book on – among other things – Hercules at the crossroads between virtue and vice is considered by some as a "witness of capital importance about 20th-century historiography of art and civilizations".[2] It marked the beginning of Panofsky's successful academic career as the prime practitioner of iconographical scholarship, and as Aby Warburg's most influential follower.

There is more to it than the erudite reference. In an interesting turn of events, Panofsky's heritage seems to be having an afterlife, just like the classical myths whose tortuous passage into humanist culture he traced so deftly. Last year, an ambitious article set out to provide the analysis of huge amounts of digital visual materials (Big Image Data) with an art historical framework. The author resorted to the piece of Panofsky's methodological writings that any student of the discipline has repeatedly stumbled upon: his famous distinction among pre-iconographic, iconographic and iconological levels of interpretation for any given image.[3]

Harald Klinke's article in the second issue of the *International Journal for Digital Art History* took up this "proven model", "a three-stage general epistemology of visual perception", and built it as the top of a layer model for the understanding of digital im-ages as information.[4] Thus, he turned to Panofskyan iconography, in search for art historical grounding and ancestry. It comes as no surprise: a number of early digital repositories of art historical information had already taken up the method.[5] For instance, iconographic research tools such as Henri van de Waal's ICONCLASS or Princeton University's Index of Christian Art were transitioning into electronic tools as early as 1990 and 1991, respectively.[6]

This renewed interest has an older genealogy. In April 1968, the Metropolitan Museum organized, with collaboration from IBM, the conference *Computers and their potential application in museums*. It was the first DAH (Digital Art History) event ever, as well as the fourth in a series organized by a former student of Panofsky, Edmund A. Bowles, who helped IBM to develop nothing other than a promotion strategy addressed at a potential new market for their mainframe computers: namely, cultural institutions.[7]

It is not my intention here to test this genealogy, nor to claim a privileged usefulness for the iconographic method within DAH. Both points seem worthy of more attention, in any case.[8] Rather, my first goal is to offer a quick map of the current state of the field, and to do so by describing the metaphors and ideas that are being put forward to characterize DAH efforts. What are the doubts, the disputes, and the agreements, at this moment? Secondly, and more importantly, I also intend to provide some

clues for the wanderer. Not so much about his or her destination, but rather about how to be best equipped for the walk beyond the crossroads.[9]

On delays and gaps

Before beginning to chart the map, one may wonder about timing, even if very briefly. At a moment when art history faces the experiment of new disciplinary forms like visual studies, Digital Humanities (DH) pose an added challenge to the field.[10] It has become quite common to note the significant gap between art history and other humanistic branches of learning in the adoption of the tools, methods and contents that characterize DH. When James Cuno, president of the Getty Trust, titled a short opinion piece "How art history is failing at the Internet", he was voicing an all-too-common concern about art history's "sluggish" embrace of new, digital technologies.[11] Similar remarks from other scholars have highlighted different aspects of this delay.[12]

A more positive evaluation is possible if we change the frame of reference, by looking at the specificities of art historical scholarship, rather than comparing it to other humanistic fields of enquiry.[13] In fact, digital-born versions of the different humanities' disciplines have not proceeded along the same paths.[14] Among other reasons, because the technical possibilities of computing have not progressed at the same pace for each field.[15] This acknowledgement opens the door to a more realistic approach to the situation.[16] From this perspective, claims on DAH's alleged delay not only lack a solid basis; they also misguide newcomers and turn the criticism into a self-fulfilling prophecy.[17] A deeper awareness about art historical methodological diversity should provide a better perspective on the ways in which current practice builds on top of already-existing disciplinary developments, paying more attention to the continuities and not only to the ruptures.

The "digital turning point" mentioned by Nuria Rodríguez or, to return to our leitmotiv, the crossroads, provides a fitting description of the situation.[18] There is no need to cast doubt on the discipline's adaptability in a changing environment of practices, means and, should that come to happen, goals.

Disciplinary debates

Obviously, all the above begs the question about art history's specificity. Attempting to identify DAH's promise and usefulness very quickly leads to questions about the epistemological tenets of the entire discipline. [19] The question about what art history is, as a discipline, goes well beyond the scope of this essay, of course. However, it is necessary to remind ourselves that reconsidering the disciplinary foundations is the difficult, crucial task that each generation is invited to carry out. The intersection of art history and digital culture is just another – excellent – occasion to do so in our time. Otherwise, we risk ceasing to provide a useful contribution to our societies' intellectual enrichment.

So far, most explanations about that intersection have pointed out two existing approaches. Johanna Drucker expressed it very clearly in 2013: "a clear distinction has to be made between the use of online repositories and images, which is **digitized art history**, and the use of analytic techniques enabled by computational technology that is the proper domain of **digital art history**".[20] Thus, on the one hand, we would have art-history-done-with-digital-tools, a paradigm of (vastly improved) access but no disciplinary transformation. On the other, DAH, the promise of something

else, a different, digital-born set of tasks, questions and methods.

Until now, academic response to this second option has been hopeful and skeptical. Even conceding that such transformative practices are very likely to arrive, they still seem slightly remote. Again, Drucker explains it most forcefully: "I am not sure that there is anything like a 'digital art historian' at this point. […] The humanities, and art history, may not be changed substantially at this point by being 'digital' – and maybe that is just fine".[21] Currently, digital art history (understood as new research concepts, fully shaped by digital culture) is still scarce; at least, when compared to digitized art history (understood as digital tools in the service of traditional questions), that is thriving, instead.[22]

In the end, it makes no sense to expect a complete substitution or transfer between either trend, or the disappearance of one or the other. There is and there will be coexistence, hybridization and mutual influence. A whole array of possibilities, some of them still unimagined, remain open in front of us. At some point, the "digital" will cease to be new and differential, as already seen in other fields.[23] There might be just another methodology or sub-discipline, distinct yet related and complementary to the rest; or a broader scenario of evolution towards even greater interdisciplinarity.

This leads back to the invocation of the foundations, as suggested by Zorich: "Art historians might revisit a strategy commonly used in the early days of the discipline, when the field's greatest thinkers explored interdisciplinary approaches and adapted them to art historical pursuits".[24] By name, tradition and vocation, art history is interdisciplinary. Computer scientists are just the last guests to an ongoing banquet where many and diverse diners have taken their share and enriched the conversation, too.

In this regard, art historians (and other researchers in the humanities) are in urgent need of overcoming what Murtha Baca aptly named "the Saint Augustine syndrome" [25]: our traditional self-understanding as lonely intellectuals, toiling in our minutely crafted texts through years of erudite work in isolation. Teamwork, collaboration with ICT scientists, and opportunities for "bilingual" scholars trained in both fields, are already an obligation for any forward-looking effort in art historical research, although it is too soon to learn which paths will lead further. [26]

Striking a balance between daring experimentation and banal "discoveries" might be one of the most important challenges ahead. Avoiding these dangers requires serious art historical training and demanding scholarly standards, in order to keep the conversation a true *symposion* and not just talk over dinner.[27] In a frontal criticism of what she perceives as the flaws of DAH, Claire Bishop has pointed out to an alleged oblivion of interpretation in favor of expanded coverage. As she puts it, "computational metrics can help aggregate data and indicate patterns, but they struggle to explain causality, which in the humanities is always a question of interpretation".[28]

As will be seen later, the issue of DAH's alleged minimal interest for interpretive purposes is connected to qualitative and quantitative methods; more exactly, to their possibilities and limitations. By now, I want to draw attention to the fact that interpretation is always built into any computational analysis of art historical data. Knowingly or not, any digital resource or tool already incorporates a set of assumptions about what is worth looking for, in any given dataset. Gigapixel art images, for instance, are not merely mechanical applications of a hugely improved imaging technology; they depend, for instance, on the assumption that a close analysis of painting surface, materials and

brushwork reveals meaningful information to a viewer, who can in turn connect it to a broader understanding of the artist's oeuvre.

The "crucial recognition that digitization is not representation but interpretation" is a tenet for the creation or use of any digital resource in the humanities.[29] Theorists and (most) practitioners of DAH are very much aware of this principle, but its importance cannot be stressed enough.[30] Otherwise, any research is doomed to naïve blindness about its own implications and presuppositions, to an immediate acceptance of unexamined "findings", purportedly backed up by scientific and technological innovations.[31]

Asking good questions matters much more than the available technology, just like epistemological awareness must accompany its use. There is consensus on this issue, as expressed by Klinke: "art-historical research should not be driven by the promises of information technology, but by its very own epistemic goals. Digital Art History should therefore not ask what to do with all those images, rather start with what we want to find out, and then ask how computers can assist us in this task".[32] Nonetheless, it is also true that some questions are not even asked if answering them seems completely out of reach. Consciously or not, we tend to limit our questions only to those having a reasonable expectation of being answered. Indisputably, DAH is broadening the scope of those enquiries: "data visualizations can trigger a suite of possible solutions and questions as well as answers."[33]

Recognizing the priority of questions over technologies amounts to acknowledging that at the beginning and the end of research, what makes the difference is the human interpreter, not the machine. Which leads me to a last disciplinary issue. If epistemological and sociocultural unawareness

are to be avoided (and truly so), what follows might naturally be the call for "a well-articulated, systematic, programmatic critical discourse that goes beyond a mere description of what currently exists",[34] or for an engagement "in public and proactive debate to discover the most appropriate computational tools and analytical techniques" for DAH.[35]

This debate is, by all means, a necessary one, and definitely worth the time spent on it. In fact, it has been very fruitful since at least a decade, as attested by the references quoted in this essay, and many others. Here, however, one could very well return to Panofsky, and his well-known assertion that "the discussion of methods spoils their application".[36] There is much to learn and reflect upon, in all these discussions; but they should not stop new undertakings. Waiting for the appearance of a disciplinary consensus, or claiming for the need of such an agreement, overlooks the fact that disciplines rarely (if ever) are the orderly result of a previous planning. They can be the unexpected, detached, disputed and precious offspring of unaware, or even embarrassed, parents.

It is impossible to plan such a development.[37] The real location will always be much messier than the map, including the one drafted here so far. It is essential to understand the different concepts being put forward, and hence the need for critical discourse. Any discipline can benefit greatly from foresight, advocacy, and institutional support. Ideally, technological experimentation and sound intellectual debate should go hand in hand. In the end, though, things could more likely come as wished by CR Johnson: "my sense is not to try and predict – but get the data there and then we will see what happens – things I can't even guess now!"[38]

Practical concerns

Even after the researcher decides to get the data out and "see what happens", giving some consideration to the opportunities and pitfalls that lie ahead of the crossroads will be a great help. I provide here some such reflections; first from intellectual and methodological perspectives, and then from institutional and professional angles.

Dealing with missing and ambiguous data is an important challenge. Lacunae in historical sources are much harder to discern in compiled texts than in data visualizations. The former are always selective in the choice of relevant data; therefore, lack of specific sources can be better overlooked as long as the general discourse can still hold together a forceful argument. The latter, however, rely most times on visualizing a continuum stream of data.[39] Breaks in that continuity offer both challenges and opportunities for researchers and visualization specialists.[40] The same happens for entities that had unstable characterizations or terminology: mapping them into current data fields or our controlled vocabularies risks distorting their original, ambiguous specificity.[41] We need to develop ways to incorporate hypotheses, interpolations, reconstructions, and make our users aware of those additions' constructed nature.

As more and more digital information is generated and published online, the huge disparities in data formats and records' structures pose new challenges. The possibility to query multiple databases from a unified interface increases greatly the reach of our questions, but it also requires interoperability standards that allow one to map data between different formats and schemes. Many prefer an approach that relies on encoding information, structuring it with highly curated and specialized metadata.[42] The elaboration and efficient usage of information standards entail in-tensive human labor, as well as extended institutional commitments that usually become lengthy and costly.

These practical difficulties have led others to become wary of structured information,[43] and rely on more recent approaches, such as artificial intelligence, deep learning or semantic web applications. Querying repositories that hold massive amounts of information through full-text or image-matching searches has become much more effective in the last decade. If the repositories are large enough and search refining technologies are properly applied, results can be very informative and open up new, unexpected associations. A careful consideration of each specific situation should help us to decide which way to go, or how to integrate both structured and unstructured approaches.

Another split to take into account is the one between quantitative and qualitative methods. The latter have traditionally been the very center of art historical work, trying to elucidate aesthetic or intellectual value through widely differing methods, but none that included quantification of properties. From a historical point of view, however, other kinds of information admit parameterization, which in turn admits computational processing. This allowed Drucker to assert that "for the most part, data mining in art history depends on the processing of textual material, so it is particularly suited to analyzing the discourses of art history, rather than its objects".[44] Having the ability to establish networks of concepts and terms, linking them to geographical and chronological developments, can be very helpful in assessing the evolution of aesthetic ideas or artistic practices as registered in written texts.

It is important, on the other hand, not to stray away from hermeneutical caution and experience. In many cases, those changes in terminology or critical apprecia-

tion have already been deeply researched by traditional scholarship, and newer, automated studies have only served to reinforce what was accepted by that time as a consensus among the specialists. Moreover, Drucker's emphasis on texts was understandable for 2013, but not for current and future developments. Today, massive analysis of images is much more developed, allowing for studies similar in reach to those performed on texts.

Results from quantitative methods are more useful in tracking down general trends, rather than singular features or exceptional individuals, the topics that traditionally formed the core business of humanistic disciplines. Drawing new attention towards other subjects that had been overlooked can in itself offer chances for valuable contributions, and a more inclusive art history.[45] In Kohle's words, "Databases produce a decanonizing effect".[46] On the other hand, the usage of massive textual sources can give credibility to often-repeated but factually wrong affirmations. Misguided connections and metaphors might receive a scientific, statistical grounding, an aura of objectivity and truth, making things even worse by perpetuating legends and clichés instead of rigorous fact checking. In this scenario, DAH would just reinforce "uncritical assumptions about the intrinsic value of statistics" and the "subordination of human activity to metric evaluation", according to Bishop.[47]

These criticisms point to a possible but – in my opinion – unlikely danger. No one is advocating digital technologies as an objective, unmediated methodology in the humanities. They are intended as an addition, not a substitute.[48] Human validation and analysis remain necessary after all the digital aids have provided their output.[49] In fact, with help from digital tools the expert can devote less time to the search of documentation and more effort to the tasks where we humans work at our best: judgment, interpretation, evaluation. New hypotheses, new questions can be proposed to researchers, but answering them still requires a qualitative input that no machine can provide.

The comparison between close and distant viewing provides a fitting translation of the just-mentioned differences between qualitative versus quantitative approaches. As summarized by Klinke, "'Close viewing' describes the study of individual reproductions of artworks. In the same vein, 'distant viewing' describes what algorithms are increasingly able to offer: examining an infinite number of images at once and deriving meta information from that corpus of images."[50] A qualitative, micro, value-based approach and a quantitative, distant, data-driven contextualization complement each other.[51] The technologies behind massive visual recognition are in their early developing stages and, while already useful, they still offer ample room for improvement. However, they will never replace human interpretation. Cultural complexity operates at many levels that seem impossible for computers to grasp. Visual connotations and literary references can be very subtle, yet (precisely because of that) so powerful at the same time, as in Daniel Coves re-elaboration of Vermeer's classic (see fig. 1 and 2). It is only normal if computers fail to find these kinds of connections; but why not have them attempt to do so, just in case some new relationships do appear, and can then be subject to rigorous analysis.

Fig. 1: Daniel Coves; *Net no. 3*; 2012; oil on canvas mounted in metal case; 126 x 126 cm; Valencia, Fundación Mainel. (© Daniel Coves)

Fig. 2: Jan Vermeer; Girl Reading a Letter; (image taken from https://flic.kr/p/dnEBWH, under CC license 2.0)

From an organizational perspective, DAH is slowly moving from a scenario of **projects** to another one of **institutions**, having sustainability and permanence as their ultimate goals. We have gone through more than 30 years of disconnected proofs-of-concept, one-off data collecting experiments, discontinued efforts, ever-growing varieties of data formats, unstoppable change in operating systems, software solutions, information standards, etc.[52] Competitive funding has been available, but always on an unstable and short-term basis. This has involved the disbandment of trained teams just when their learning process was yielding their best results. In many cases, the outcomes have been digital, interactive iterations of the traditional products of art historical research: the monograph and the catalogue. Most often, interesting, arduous and well-meaning projects were conceived as ends in themselves, as demonstrations, rather than building blocks for larger information systems.

Institutions, instead, comprise a variety of settings that go well beyond a single commission or a grant-funded undertaking. They might be endowed chairs, professorships, centers or even departments, within universities; DAH specialized staff within interdisciplinary DH centers; stable teams within research institutes; digital centers or departments within museums; special interest groups within professional associations; and so on. This is not only a matter of financial stability, important as that is. It is also about a focus on sustainability, interoperability, common standards, open access and shared resources. For instance, museums are increasingly expected to offer as much information as possible: not just high-resolution images, but also conservation notes, technical analyses, research publications, provenance and other historical information, metadata associated to the digital resources themselves... Public fund-

ing agencies push to make research results readily available through open access frameworks. Research institutions are requested to think ahead and implement data management plans, develop models for migration, foster partnerships with libraries and archives, promote resources produced across institutions, etc.[53]

Again, a total abandonment of projects and a proliferation of institutions is not to be expected. Both schemes will continue to play important roles in DAH, although the current predominance of the former over the latter should come to be reversed in a not-so-distant future. For this to happen, professional development and career opportunities must be put in place. What kind of profile should these specialists bring to bear?

An ideal profile combines training and/or expertise in both fields, art history and computing. Dual experts, with comprehensive knowledge in the two disciplinary environments, can and will make relevant contributions. Moreover, they will help to raise awareness about their relevance as full-fledged scholars, not mere technical assistants.[54] It must also be acknowledged, though, that those profiles may be scarce and hard to find. Mastering two such differing areas of knowledge is really demanding, even if only at an undergraduate level, never mention in advanced degrees.

A more common career might be that of "the translator – the person able to mediate between the art historian and the computer scientist".[55] This professional will come from one field, but will also have enough knowledge of the other to start and facilitate interdisciplinary exchanges. (Some mediation skills would also help a great deal.) On the other hand, markedly disciplinary settings will not easily integrate such a liminal profile. Moreover, these tasks can easily fall on the shoulders of junior staff (graduate students, IT specialists, young as-

sistants), paradoxically downplaying their importance. They deserve proper recognition and a clear integration into the general workforce.

As always, education is the best strategy. DAH training should become standard as soon as possible, on a variety of settings: as an introduction to digital tools and methods for graduate students in the humanities; as independent certificate programs; as mentoring for specific projects; as interdisciplinary courses, offered (jointly or separately) for art history and computing students, etc.[56]

One may imagine computer scientists and their students to be very distant from arts and humanities research. We art historians, seen from the IT side, probably look just as far-off.[57] The burgeoning amount of DAH literature, and the interdisciplinary collaborations behind it, belie those impressions. From our side, greater self-confidence about our discipline's value is a first step. Facing the ever-growing importance of visuality in contemporary culture, we should not fail to make the case for our ability to analyze and interpret images, and to do so in a flexible and engaging manner.[58]

Speaking our ways forward

The ways to carry out those tasks I just mentioned will be as diverse as always. Instead of pointing to a single (and very unlikely) best road, I have preferred to linger on the crossroads for some more time. From the previous theoretical and practical considerations stems the conviction that no particular agenda could shape DAH's next steps. In this scenario, computational tools are a very relevant factor, but not the central one. Revolutionary technologies are useless if applied uncritically, or for their own sake. [59] A better art history, including DAH, re-

quires a greater self-awareness, a deeper knowledge of the discipline's history, as well as the attention to contemporary issues that provide the chance to keep it intellectually relevant. Art historians, and interdisciplinary scholars who to some degree participate in the same methods and interests, have the responsibility to get involved in the digital development of the discipline. As Pamela Fletcher so fittingly recapitulates, "Technological change, as many are quick to warn, may well be inevitable, but the development of an intellectually generative digital art history is up to us".[60]

Notes

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All mentioned URLs are valid as of October 13, 2017.

1. Erwin Panofsky, *Hercules am Scheidewege und andere antike Bildstoffe in der neueren Kunst* (Studien der Bibliothek Warburg), Leipzig 1930.

2. Dieter Wuttke, *Panofsky et Warburg. L'"Hercule à la croisée des chemins" d'Erwin Panofsky. L'ouvrage et son importance pour l'histoire des sciences de l'art,* in: *Artibus et historiae*, 28, 2007, p. 49.

3. Erwin Panofsky, *Zum Problem der Beschreibung und Inhaltsdeutung von Werken der bildenden Kunst*, in: *Logos*, 21, 1932, p. 103-119. Expanded and revised versions of the essay, incorporated into his *Studies in Iconology* (1939) and *Meaning in the Visual Arts* (1955), brought it to much broader audiences.

4. Harald Klinke, *Big Image Data within the Big Picture of Art History*, in: *International Journal for Digital Art History*, no. 2, 2016, p. 24-25.

5. Iconography itself is not rooted in a single historiographical tradition, of course. Even if I have mentioned Erwin Panofsky as its best known representative, it cannot be ignored that other scholars took up this method from their own theoretical and intellectual origins, in many cases quite independently from Panofsky or from the Warburgian school.

6. http://www.iconclass.nl/about-iconclass/history-of-iconclass/history-of-iconclass and https://ima.princeton.edu/history/.

7. Margarete Pratschke, *Digitalität und Kunstgeschichte. Digitale Mythen: Der Iconic Turn, die Bilderflut und die Versprechen des ewig Neuen*, in: *Digitalität*, https://digigeist.hypotheses.org/category/konzeptpapier/kunstgeschichte, 15-07-2016.

8. See, for other Warburgian perspectives on the issue: Hans Brandhorst, *Aby Warburg's Wildest Dreams Come True?*, in: *Visual Resources*, 29, 2013, p. 72–88; and Elli Doulkaridou, *Reframing Art History*, in: *International Journal for Digital Art History*, no. 1, 2015, p. 67-83.

9. Any *status quaestionis* (such as this) requires extensive quotations, in order to do proper justice to the referenced literature. For a more readable main text, many of these quotations are included as endnotes.

10. The troubled relationship between art history and visual studies might constitute by now an independent discipline in itself. For a critical reevaluation, see *Farewell to Visual Studies*, edited by James Elkins, Gustav Frank and Sunil Manghani, University Park, PA 2015.

11. James Cuno, *How Art History Is Failing at the Internet*, in: *The Daily Dot*, https://www.daily-dot.com/via/art-history-failing-internet, 19-11-2012.

12. Diane M. Zorich, *Transitioning to a Digital World. Art History, Its Research Centers, and Digital Scholarship*, Samuel H. Kress Foundation and Roy Rosenzweig Center for History and New Media, 2012, p. 20: "There is a pervasive sense that the discipline is too cautious, moves too slowly, and has to 'catch up' in the digital arena."
Diane M. Zorich, *Digital Art History. A Community Assessment*, in: *Visual Resources* 29, 2013, p. 14: "unlike other fields in the humanities, art history has been reluctant to embrace this [digital] transition. As of this writing, relatively few art historians are pursuing digital art history projects, and art history research centers are not supporting digital scholarship in a manner comparable to that of digital humanities centers."

Brandhorst 2013, *Aby Warburg's*, p. 81: "our feeling of disappointment means that there is some kind of mismatch between expectations and results, and that we should reflect on our expectations."

Previous examples of this kind of self-criticism can be traced farther back. For instance, to Barbara Stafford's opening remark about art historians and digital images in 1997: "We have finally sailed into the imaging age and strangely, art history is not at the helm. Perhaps I am not alone in thinking that there is something deeply embarrassing in our having relinquished to communication schools and literary studies departments, almost by default, any leadership role in the sweeping visualization revolution." Barbara Stafford, *Educating Digiterati*, in: *The Art Bulletin*, 79, 1997, p. 214.

13. Doulkaridou 2015, *Reframing Art History*, p. 79: "this kind of specifically art historical epistemological awareness is essential if we want to bridge the gap between traditional methodologies and innovative computational practices. Historically relevant epistemological perspectives are just as important as the vision of things that we could not do before."

14. Nuria Rodríguez Ortega, *Humanidades Digitales, Digital Art History y cultura artística. Relaciones y desconexiones*, in: *Artnodes*, http://doi.org/10.7238/a.v0i13.2017, 2013, p. 20-21: "el panorama del diálogo entre la cultura artística, las tecnologías computacionales y el medio digital se nos presenta distinto si lo observamos desde fuera del campo de las Humanidades Digitales, es decir, desde la perspectiva de su propia vertiente de desarrollo. … Las Humanidades Digitales y los estudios computacionales relacionados con la cultura artística se han desenvuelto por caminos paralelos, caminando la mayor parte del tiempo desconectados."

15. Klinke 2016, *Big Image Data*, p. 16: "The visual sciences, the foremost being Art History, started to integrate computational methods in the early 1980s, but progressed slowly for several reasons. The most important reason is that images are much harder for a computer to process."

16. Matthew P. Long and Roger C. Schonfeld, *Supporting the Changing Research Practices of Art Historians*, Ithaka S+R, 2014, p. 6: "While it is still in its developing stages, the research approaches of 'digital art history' will likely differ substantially from the methods that have been popular in other humanities fields."

17. Some authors have begun to trace a genealogy of less-known digital art historical projects from 1980s and 1990s, helping to reverse the discourse about DAH's alleged late arrival. See, for instance, Benjamin Zweig, *Forgotten Genealogies. Brief Reflections on the History of Digital Art History*, in: *International Journal for Digital Art History*, no. 1, 2015, 38-49.

Anna Bentkowska-Kafel, *Debating Digital Art History*, in: *International Journal for Digital Art History*, no. 1, 2015, p. 60: "The embrace of digital technology in the best possible manner and in intellectual fusion, not in opposition to critical and methodological traditions of the discipline, is a way of demonstrating that there is no 'crisis', no 'lagging behind', that continues to plague the reputation of the academic history of art and is discouraging new students."

18. Nuria Rodríguez Ortega, *Digital Art History. An Examination of Conscience*, in: *Visual Resources* 29, 2013.

19. Nuria Rodríguez Ortega, *Getty Voices. It's Time to Rethink and Expand Art History for the Digital Age*, in: *The Getty Iris*, http://blogs.getty.edu/iris/its-time-to-rethink-and-expand-art-history-for-the-digital-age/, 2013: "we need to 'rethink art history' all the way back to its conceptual foundations." She develops the same idea in 2013, *Digital Art History*, p. 133, and 2013, *Humanidades Digitales*, p. 23. On a similar note, Cuno 2012, *How Art History Is Failing*: "The promise of the digital age is far greater than [access and dissemination]. It offers an opportunity to rethink the way we do, as well as to deliver new research in the arts."

20. Johanna Drucker, *Is There a "Digital" Art History?*, in: *Visual Resources*, 29, 2013, p. 7.

21. Johanna Drucker et al., *Digital Art History. The American Scene*, in: *Perspective. Actualité en histoire de l'art*, 2, 2015, p. 12. See also Zorich 2012, *Transitioning*, p. 49; and Bentkowska-Kafel 2015, *Debating*, p. 57.

22. See the exchange between Hubertus Kohle, *Art History and the Digital Humanities. Invitation to a Debate*, in: *Zeitschrift für Kunstgeschichte*, 79, no. 2, 2016, p. 151-154, and Max Marmor, *Art History and the Digital Humanities*, ibid., p. 155-158, for a panoramic view of the situation.

23. Maximilian Schich, *Figuring out Art History*, in: *International Journal for Digital Art History*, no. 2, 2016, p. 42; Zorich 2012, *Transitioning*, p. 44.

24. Zorich 2013, *Digital Art History*, p. 20.

25. Murtha Baca, *Getty Voices. Rethinking Art History*, in: *The Getty Iris*, http://blogs.getty.edu/iris/getty-voices-rethinking-art-history/, 2013.

26. Park Doing and C. Richard Johnson, *On Applying Signal Processing to Computational Art History. An Interview*, in: *International Journal for Digital Art History*, no. 1, 2015, p. 96: "Uncertainty about the most fruitful future directions in such a young interdisciplinary field is a major reason for maintaining active cross-disciplinary collaborations in such projects. The domain is rich enough that I am convinced that some useful knowledge nuggets no one knows about now are waiting to be discovered."

27. Bentkowska-Kafel 2015, *Debating*, p. 59: "Digital research into art and cultural heritage, which has not been informed by a professional art-historical knowledge and rigorous scholarly methodology, often demonstrates inferior or uncertain cognitive value of the findings."

28. Claire Bishop, *Against Digital Art History*, in: *Humanities Futures*, https://humanitiesfutures.org/papers/digital-art-history/, 2017.

29. Drucker 2013, *Is There a "Digital" Art History?*, p. 12.

30. Rodríguez Ortega 2013, *Digital Art History*, p. 132: "the illusory belief that the digital realm is a neutral, innocuous space that delivers the information that we seek, produce, and manage in a pristine way, as if it were a mirror. This fallacy of the absence of intermediation makes it difficult for us to see the Web as a cultural, political, and ideological venue." Anna Bentkowska-Kafel, "*I bought a piece of Roman furniture on the Internet. It's quite good but low on polygons." – Digital Visualization of Cultural Heritage and its Scholarly Value in Art History*, in: *Visual Resources*, 29, 2013, p. 38: "The process of visualization involves manipulation. Scholarly visualization of heritage may only be recognized as valid and ethical when accompanied by paradata, i.e., the documentation of the evaluative, analytical, deductive, interpretative, and creative decisions made in the course of research."

31. See Bishop 2017, *Against Digital Art History*. In a similar vein, Kohle 2016, *Invitation to a Debate*, p. 152: "That the value of brightness in van Gogh's later Provençal period is greater than in his earlier works [...] comes across as trivial even though it confirms the relevance of the empirical method."

32. Klinke 2016, *Big Image Data*, p. 29. See also Paul B. Jaskot, review of *Debates in the Digital Humanities*, edited by Matthew K. Gold, in: *Visual Resources*, 29, 2013, p. 140: "The question is not what art history can do with the digital; the question is what are the important art historical questions that can be addressed with the help of digital tools?", and his call for a DAH that puts "the intellectual problem (rather than a method) at the center of the discussion."

33. Koenraad Brosens et al., *MapTap and Cornelia. Slow Digital Art History and Formal Art Historical Social Network Research*, in: *Zeitschrift für Kunstgeschichte*, 79, 2016, p. 324. See also Pamela Fletcher, *Reflections on Digital Art History*, in caa.reviews, www.caareviews.org/reviews/2726, 18-06-2015: "In the end, digital and computational techniques can be significant additions to the art historian's methodological tool kit: machines for thinking with, rather than replacements for thinking. [...] The entire field of digital art history – and probably even digital humanities – is at the very beginning of a long research experiment, and the very forms of questions that it will pose – let alone the answers it will help us to generate – are unknown territory."

34. Rodríguez Ortega 2013, *Digital Art History*, p. 132.

35. As demanded by Paul Jaskot, quoted in Digital Art History Lab Committee, *White Paper – Art History in Digital Dimensions*, http://dahdimensions.org/wp-content/uploads/2017/03/Art-History-in-Digital-Dimensions-White-Paper.pdf, 2017, p. 2.

36. Wuttke 2007, *Panofsky et Warburg*, p. 49.

37. Matthew Lincoln, in: Drucker et al. 2015, *Digital Art History*, p. 5: "As with other disciplines, discovering the ideal fit between digital methods and our theoretical frameworks will be a process of negotiation and evolution."

38. Doing/Johnson 2015, *On Applying Signal Processing*, p. 96.

39. See, for instance, the well-known visualizations derived from Maximilian Schich et al., *A Network Framework of Cultural History*, in: *Science*, 345, no. 6196, 2014, p. 558-562. They show in a very compelling manner the shifts of central and peripheral areas for "cultural history" throughout the last two millennia. However, they also make very visible the lack of information from non-Western societies for a resource that attempts to offer global coverage. Of course, the article authors are well aware of the limitations in their sources, as explained in their supplementary materials. Therefore, it is not a problem with the researchers' expertise, but a bias inherent in the datasets at their disposal, that becomes evident in the visualizations.

40. Jodi Cranston, *Review of "What Jane Saw" by Janine Barchas*, in caa.reviews, http://www.caareviews.org/reviews/2580, 18-06-2015: "Digital tools often develop precisely from and around those incomplete spaces involving the unknown and the inconclusive. […] Patterns in known and unknown information often are easier to see all at once, rather than being imagined from narrative accounts. On the other hand, unknowns and gaps are often difficult to acknowledge in data entry and capture in software programming. There is not yet an accepted 'language' for lacunae in digital projects."

41. As in Miriam Posner's quotation in Drucker et al. 2015, *Digital Art History*, p. 8: "reconstituting historical evidence into data that can be easily recognized by the computer can distort the historical record by establishing definitive categories for entities that were originally ambiguous or more fluid."

42. Ibid., p. 4: "While it may seem counter-intuitive to art historians focused on objects, the strongest benefits of digital and networked technologies for art history are in the use of structured text and data. […] But the aggregation of structured data and metadata (the information about works of art, their attribution, history, material form, iconography, and so on) is where humanities fields stand to benefit from digital methods – because the scale of search, processing, analysis, and data mining, as well as access to primary sources, so far exceeds what can be done without these tools."

43. In this sense, see John Resig, *Using Computer Vision to Increase the Research Potential of Photo Archives*, in: *Journal of Digital Humanities*, 3, no. 2 Summer 2014, quoting the programmer Jamie Zawinski: "Some people, when confronted with a problem, think 'I know, I'll use metadata.' Now they have two problems."

44. Drucker 2013, *Is There a "Digital" Art History?*, p. 9. Lev Manovich (*Data Science and Digital Art History*, in: *International Journal for Digital Art History*, no. 1, 2015, p. 12-35) provides an introduction to some basic concepts for the parameterization of art historical information: objects, features, data, feature space, and dimension reduction.

45. Jaskot, referenced in Digital Art History Lab Committee, *White Paper*, p. 3.

46. Kohle 2016, *Invitation to a Debate*, p. 152: "… databases can inevitably redirect attention away from individual works to the consideration of a broader perspective. Databases produce a decanonizing effect. At the same time, 'masterpieces' can be situated within a broader context of production."

47. Bishop 2017, *Against Digital Art History*. Drucker et al. 2015, *Digital Art History*, p. 8: "Using empirical methods to establish evidence seems quite useful, but asserting the authority of empirical evidence as if it were self-evident and absolute is just naïve."

48. Klinke 2016, *Big Image Data*, p. 29: "Data analysis for Art History means the introduction of quantitative methods into a field that has used exclusively qualitative methods throughout its existence. However, these quantitative methods are not a substitute for conventional methods, but an addition."

49. Marmor 2016, *Art History and the Digital Humanities*, p. 156: "the discovery of visual correlations that human intelligence cannot easily identify, but which only human intelligence can verify."

50. Klinke 2016, *Big Image Data*, p. 17.

51. As expressed by Matthew Lincoln in Drucker et al. 2015, *Digital Art History*, p. 4: "Successful digital art history research must unite the macro-scale description offered by computational analysis of large datasets with micro-scale interpretations of individual artists and artworks."

52. See Christine L. Sundt, *Digital Projects Past and Present – Survivors or Fossils?*, 2005, http://hdl.handle.net/1794/317, for an informative discussion about digital imaging projects, off- and online, and their sometimes-troubled survival.

53. Digital Art History Lab Committee, *White Paper*, p. 3; Long/Schonfeld 2014, *Supporting*, p. 43-44.

54. "Scientists of art and culture […] are not computer-people that provide researchers with a visualization or an automatic tool. They are not a service. Scientists of art and culture are researchers sharing the same goal, namely to understand the subjects and processes of art history." Schich 2016, *Figuring out Art History*, p. 42.

55. Digital Art History Lab Committee, *White Paper*, p. 9. See the section "Valuing Translators" in that document, for an interesting discussion about this profile.

56. Drucker et al. 2015, *Digital Art History*, p. 9; Digital Art History Lab Committee, *White Paper*, p. 12.

57. A particularly useful scenario for collaboration would be advocacy for new software tools. Zorich 2012, *Transitioning*, p. 26: "Unless art historians contribute their visual analysis skills and input to these endeavors in the software development phase, the products and tools that move into the mass market will not include features and functionality that serve their interests."

58. Long/Schonfeld 2014, *Supporting*, p. 45: "visual resources professionals may play an important role as educators and educational coordinators as visual literacy comes to occupy a significant place in university curricula." See also Fletcher 2015, *Reflections*: "the move to digital space and visuality poses questions that art historians may be uniquely suited to answer. […] art historians' long history of interpreting and analyzing the rhetoric of the visual can be of real use, particularly in the use of digital means to reconstruct and represent lost objects, buildings, and spaces".

59. Bentkowska-Kafel 2015, *Debating*, p. 61: "The future of the History of Art is in training of the observant eye and knowledgeable, critical mind, using digital tools when useful."

60. Fletcher 2015, *Reflections*.

Figures

Fig. 1: Daniel Coves; Net no. 3; 2012; oil on canvas mounted in metal case; 126 x 126 cm; Valencia, Fundación Mainel. (© Daniel Coves)

Fig. 2: Jan Vermeer; Girl Reading a Letter; (image taken from https://flic.kr/p/dnEBWH, under CC license 2.0)

Abstract

Information and Communications Technologies, and more specifically online digital media, are revolutionizing the ways to produce and disseminate scientific knowledge. Humanities and social sciences -art history among them- are not alien to this process. The new challenges and opportunities have already generated a body of thinking and abundant case studies. Many of these applications have been exploratory, disconnected, and short-lived, but nonetheless very stimulating. This essay offers a report on the state of the conversation: a meeting at the crossroads, briefly outlining debates, agreements and disagreements, (dis)continuities with the broader framework of the discipline, and future perspectives.

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