The Future of (Digital) Art History

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The description of a world in perpetual transformation constantly demands new means of expression — Bertolt Brecht

1 Introduction

It is striking to notice since how long researchers started applying computational methods to cultural data, but we remain uncertain whether computer methods are useful for humanities inquiries. The interaction between disciplines outlines a key incompatibility between concepts and metrics. This article attempts to persuade the reader about the need for a methodological reformulation for the future of (digital) art history. I argue that computational analysis methods represent an epistemological surrogate for a renewed art history. Framing the future of the field starts by spotting its current dead ends. Thus the article describes the two reasons why digital art history is failing. First, it is trying to simulate methodologies from art history. Secondly, computers are expected to talk about humanities as we humans do. That is not possible. Furthermore, that is not the goal. I'll argue that a change in perspective is necessary to build the future of the field.

2 Argumentation

2.1 Digital Art History Is Trying to Simulate Methodologies from Art History

Operationalization [8] is subject to the idea of avoiding building art history from scratch by reusing its epistemological foundations. This method is focused on the translation of traditional theories and concepts into algorithms. The difficulty of finding traditional theories that are adaptable to computational thinking is in itself the evidence why such methods should not be the focus of the field. While the scholar strives to put old questions into new contexts, the path leads to approximations of old-fashioned art historical concerns [6],[1],[4]. Every time a computer project is designed to meet the same conclusions of a traditional art historical theory it is sentenced to failure. The idea of visual universals postulated by Riegl's general laws, the formalist stylistic taxonomies systematized by Wolffin, or the fundamental system of concepts described by Panofsky are not to be refuted by computational methods. The purpose should not be to reproduce traditional theories to see if the computer is able to make a reasonable approximation, not even contradict them. Believing that digital-based projects must

solve traditional inquiries based on the same conceptual framework is falling into the same mistake. Let us imagine what the evolution of the art historical field would have been if researchers were able to use contemporary tools. It is reasonable to think that new tools will not directly solve traditional concerns; they did not exist when the questions were raised. Therefore, computational analysis represent just another valid alternative for the construction of a *science of art*. The reason why computational projects that mirror traditional methodologies fail is because humanities and computational fields do not share the same basis for creating knowledge. Art historians have consolidated their argumentation through experience and practice, endowed with a considerable amount of interpretation and speculation. It is easy to see how different intellectual perspectives lead to completely different outcomes when addressing the same topic. One possible explanation is that premises that support their arguments diverge from the beginning, guided by particular ideas that are part of a higher intellectual order. One reason to believe in a reformulation of the art history field is that if numbers are easier to trace than words, then numbers represent a more accurate alternative for a renewed epistemology. Complex language features allow an argument the impossibility of gathering evidence needed to show that its premises are true. On the other hand, researchers performing the same operations on the same data will come up with the same results (except for those of stochastic nature, where the variance can be considered to be statistically irrelevant). A computed-based project setup is therefore subject to more accurate critical evaluations. Human analysis is limited by cognition, sense, memory, and most importantly, language. Computation gives us a new language to talk about cultural artifacts, leveraging the measurement of analog values through digital computers with greater precision than the experienced eye [7]. Measurements and statistics turn abstractions into a clear and unexpected elaboration of reality, from which the formulation of new concepts should develop.

As Panofsky stated, 'The same phenomena can be described with different terms and different phenomena with the same expressions'. This is also the case when describing phenomena with computational methods. The results obtained in a computational experiment are subject to arbitrary decisions and the selection of a set of measurements that are considered representative for the purpose of the study. These arbitrary decisions subject to the scholar might be arguably related to cultural concerns to a greater or lesser extent. The scholar's decision on these objects of study is directly related to the validity of the reached conclusions. No methodological approach claims to be all-explaining or relevant to everything. It is not for me to explain the relationship between what's empirically observable and what's true. Although as already argued, it is harder to justify the veracity of an interpretation than of data.

2.2 Computers Are Expected to Talk about Humanities as We Humans Do

Due to its distinct nature from natural images, cultural data entails new challenges for computer models. While successfully addressing the practical problem

to a certain extent, most of the generated outcomes and conclusions are considered to be too general or irrelevant for art history (despite few examples where computational methods can be directly applied to critical problems in art history, such as painting attribution or forgery detection). We have witnessed several examples where the computer attempts to interpret artistic concepts (i,e., style[5], beauty[2], context[3]) through statistical and more sophisticated measures such as convolutional networks. Experiments that try to teach a machine how to interpret concepts that are based on traditional epistemology of art history will lead to computer models that hardly resemble the eye of a trained historian (i,e,. reasonable accuracy measures in style classification, or in artwork retrieval). Computers must not be trained to see like an art historian because computers and humans see differently. Since the analysis tools have changed, so will the intellectual perspectives. Moreover, the direct translation of a subjective opinion into a measurable parameter is doomed to failure. We cannot expect to reduce a complex human evaluation to a statistical representation. The aim must not be to make the computer interpret concepts, but rather to start framing the conceptual problem based on measurements. Therefore, the point is not to expect computer-based projects to address inquiries from humanities critically, but to enhance the art historian by using hidden information reached by computer methods to construct knowledge differently. Computational methods allows the historian to make statistical comparisons, measure similarities, and visualize complex layers of information never accessed before. The new spectrum of possibilities will tackle new concerns, new targets, and new conclusions.

It is clear that computational and human analysis techniques are different, so it is reasonable to think that the study of the same phenomena will also differ. But, why should concepts emerge from measures? I argue that computational methods are not an obstacle to the framing of meaningful research questions (illustrative examples have already been mentioned by Johanna Drucker[1]). Art involves emotionally charged expressions in its creation, but its analysis does not need to. Art history studies rely firstly on data, whatever the type, which is then interpreted in layers of contextualization aiming to describe the development of human artistic production. Leveraging computer features to understand such data seems like a reasonable thing to do, even if that analysis is decontextualized and cultural-agnostic. We do not need machines that interpret emotions, nor understand conceptual purposes, but rather a machine that analyzes such creations. The artwork is a digitalized image, a signal, and thus is now considered a mathematical problem. Once the problem is solved, the art historian must interpret the phenomena where the same visual elements produce different meanings when placed in different contexts. It is the art historian who will retrace the evolution of a specific pictorial motif, and reconstruct connections between paintings and artists based on the empirical model observed by the computer. While the use of such a model to extract information is not self-explanatory, it serves as a parallel source of information open for the interpretation of trained historians. The struggle of computational outcomes to explain causality does not

[1] See Johanna Drucker and Claire Bishop: "A Conversation on Digital Art History".

justify rejection. Computers are the medium through which the historian will communicate the message.

3 Conclusion

Digital art history is failing for two reasons. It is trying to reproduce approximations of already existing theories and concepts, and computational outcomes are judged under the same conceptual framework as traditional epistemology. Unlocking the limitations of human features to explain complex processes, entails a decentring of the art historian as the interpreter of images. If computers are not useful for solving traditional art-historical concerns, then new research questions based on computational thinking are required. The future of the field holds a need to construct a new language based on mathematical rationality and algorithms, in resonance with a shift in complexity and scale. The evolution of art history itself must build upon the quantitative understanding of visual structures that expand our comprehension, allowing the art historian to qualitatively generate new conceptual models to characterize visual culture. Once shed light on the embedded information hidden under visual data, the field demands awareness of the epistemological consequences that should be carried out by trained historians. The 'digital' prefix for art history will disappear when we describe, compare, and contextualize based on the analysis of computational methods.

As new technologies emerge, the research community is in a continuous phase of experimentation. The field needs an updated critique that acts as a guide to detect unsuccessful attempts. A critique that surpasses the idea of technological dehumanization of cultural analysis. A critique endowed with awareness of the limits, pitfalls, and changes embedded in this paradigm shift. The field is in urgent need of constructive criticism focused on guiding the development of tools that will be used at a user level as new analysis techniques. Art history, characterized by its retrospective endeavor, has been constantly subjected to progress and will continue to unfold. The intervention of computational techniques for the analysis and interpretation of cultural creation is more a consequence than a choice.

References

1. Cetinic, E., Lipic, T., Grgic, S.: Learning the principles of art history with convolutional neural networks. Pattern Recognition Letters **129**, 56–62 (2020). https://doi.org/https://doi.org/10.1016/j.patrec.2019.11.008, https://www.sciencedirect.com/science/article/pii/S0167865519303228
2. De La Rosa, J., Suárez, J.L.: A quantitative approach to beauty. perceived attractiveness of human faces in world painting. International Journal for Digital Art History (1) (2015)
3. Garcia, N., Vogiatzis, G.: How to read paintings: semantic art understanding with multi-modal retrieval. In: Proceedings of the European Conference on Computer Vision (ECCV) Workshops. pp. 0–0 (2018)
4. Impett, L.L., Moretti, F.: Totentanz. operationalizing aby warburg's pathosformeln. New Left Review pp. 68–97 (2017)
5. Kim, D.S., Liu, B., Elgammal, A., Mazzone, M.: Finding principal semantics of style in art. In: 2018 IEEE 12th International Conference on Semantic Computing (ICSC). pp. 156–163. IEEE (2018)
6. Madhu, P., Marquart, T., Kosti, R., Bell, P., Maier, A.K., Christlein, V.: Understanding compositional structures in art historical images using pose and gaze priors. CoRR **abs/2009.03807** (2020), https://arxiv.org/abs/2009.03807
7. Manovich, L.: Data science and digital art history. International journal for digital art history (1) (2015)
8. Moretti, F.: "operationalizing": or, the function of measurement in modern literary theory. **60**(1), 3–19 (2014)