Art History Will Survive Yet Another Machine

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Art historians are worried about machines again. Well, most are not, but some still are. Nothing new there. The current object of concern is artificial intelligence used to analyze images of paintings and compare them with accepted works by an artist. The worry is easy to recognize. A computer, we are told, cannot understand artistic intention, historical context, iconography, beauty, personality, inspiration, or the particular feeling of standing in front of a great painting. All true, and equally true of a spectrometer. The history of art has repeatedly absorbed technologies that initially seemed alien to a discipline built around human eyesight and judgment. Some arrived from physics, some from chemistry, some from medicine, some from military technology. They produced information that the trained eye could not obtain on its own. That could be uncomfortable for people whose authority rested on having the best trained eyes in the room, or on the planet. Or at least claiming to. Sir Joseph Duveen provides a useful early example. Duveen was the most powerful art dealer of his generation and had a magnificent stable of experts at his disposal, the most famous of which was Bernard Berenson. In the 1920s, he was sued by Andrée Hahn after publicly dismissing her supposed Leonardo, a version of La Belle Ferronnière, as a copy. The case became a celebrated battle over who had the right to decide whether a painting was genuine. The trial also brought a relatively new technology into the courtroom: X-ray photographs of paintings. X-rays had been discovered by Wilhelm Röntgen in 1895 and were soon tried on artworks. By the time of the Hahn case, they could reveal layers and changes below the visible surface. X-rays of the Louvre painting showed corrections and other features that helped distinguish it from Hahn’s version, which was clearly a later copy, and probably not by Leonardo at all. Technology vindicated the opinion of the experts. Duveen benefited from the evidence even if he disliked the principle behind it. He was not a fan of technical methods for authenticating art. Of course he wasn’t, because without the more objective lens of scientific analysis, he was the one who decided who had painted what. Science could contradict him, embarrass him, lose him money. But Duveen was happy to use scientific assistance when it helped his case, while remaining wary of a machine acquiring standing in territory ruled by connoisseurs. He had reason to be touchy. The jury in the Hahn case was unable to reach a verdict and expressed distrust of connoisseurs, who were painted by Hahn’s lawyers as elitist fancy foreigners trying to rob a hardworking American of a treasure they had acquired. The evidence was clearly in Duveen’s favor, but since the jury wasn’t, Duveen chose to settle before a retrial. His experts had included some of the biggest names in European art history, but suddenly a piece of medical equipment had been invited into the same argument. X-radiography is now standard museum practice. Nobody visiting a national gallery worries that the X-ray machine is plotting to take over the curatorial department. Infrared reflectography had a similar career. In the 1960s, the Dutch physicist J. R. J. van Asperen de Boer developed a system that used infrared radiation to penetrate paint layers and reveal carbon-based underdrawing. His 1970 dissertation helped establish the method, which became increasingly important in the 1970s and 1980s. For an art historian, the results can be thrilling. A finished painting may look settled and inevitable. Infrared can expose the drawing underneath, along with pentimenti: abandoned ideas, repositioned hands, altered heads, changes in drapery, and evidence of how a composition developed. It lets us watch an artist’s thought process as they worked towards the finished picture we all can see at the surface. It also moved another class of evidence away from the exclusive control of the expert human eye. A connoisseur could argue that a

passage “looked to be” characteristic of Bosch, Van Eyck or Leonardo. Infrared might reveal whether the working process underneath the paint resembled the artist’s established habits. A painting that looked unchanged on the wall could suddenly come with an entirely new dossier of evidence. That technology, too, began as threatening to some, more conservative members of the art world, and eventually became ordinary and universally accepted. The Bosch Research and Conservation Project used systematic infrared photography and reflectography to study how Bosch developed his compositions. The Metropolitan Museum has used infrared reflectography to investigate Van Eyck, Vermeer and many others. The National Gallery’s Technical Bulletin has spent decades publishing research based on scientific examination. The physicist with his strange camera gave art historians better material to argue over. Carbon-14 dating brought a different sort of challenge because it could attach dates to organic materials through radioactive decay. Its use in cultural heritage began soon after Willard Libby developed the method in the 1940s. The implications were obvious: a work assigned stylistically to one century might contain material that pointed elsewhere. That sounds wonderfully decisive until the complications arrive. A piece of wood can sit for decades before someone paints on it. Old canvas can be reused. Contamination can distort a sample. Sampling destroys a tiny part of the material being tested. The scientist supplies a result, then the historian and conservator have to work out what that result means for the object in front of them. Modern forgers have learned to use old supports because tests on canvas or wood can otherwise expose them. More recent radiocarbon methods can sometimes examine the organic binder in paint itself. Nuclear testing after 1950 changed atmospheric carbon-14 levels so dramatically that modern material can carry a distinctive signature. In a 2019 study, researchers tested a supposed nineteenth-century painting made on genuinely old canvas. The canvas caused no problem. A tiny sample of the paint binder dated to after 1950. The forger had chosen his canvas carefully and was betrayed by the paint sitting on top of it. Expertise had acquired another instrument, plus several new opportunities for disagreement. A key remains, however, in the history of each of these pieces of new technology as they were integrated into the study of art. A predictable pattern. New tech arrives. Many misunderstand it, some are nervous that it will take over their positions of power. There is scepticism, attempts at dismissal. The technology improves, some of the naysayers become converts, and in a few years’ time the scary new tech is absorbed into the arsenal available to human art historians to help them understand and analyse historical objects. And so it shall be with AI image analysis. It’s already well on its way. The initial wave of nerves have largely quieted, the naysayers are fewer and their concerns less resonant, as it’s clear that most of their concerns are based on their insufficient understanding of the very technology they are worried about. Today’s technical art historian can call on X-radiography, infrared reflectography, ultraviolet imaging, dendrochronology, Raman spectroscopy, macro X-ray fluorescence, multispectral imaging and a growing arsenal of other methods. These tools have different jobs. Some reveal hidden layers, some identify elements or pigments, some date materials, some map features across a surface. They have become part of normal scholarly practice because they answer useful questions. But the part that has been true throughout is that the machine doesn’t do it all. It doesn’t take over any human jobs. The results of the technical analysis are there to help trained humans make better-informed decisions. AI image analysis systems must be taught by humans how to recognize the work of an artist. This is not a situation of uploading an image to ChatGPT or Claude and asking “Is it a Monet?” Good results come only from good tests, and those are run by top AI image analysis firms who use a team of human researchers to teach their AI, and the results are then analysed and interpreted by humans. Think of it like an

MRI or an EEG test. Those machines haven't taken over your doctor's job. They are merely high-tech tools that make your doctor better at her job. An artist-specific AI model can compare a disputed image with a large body of accepted works and relevant negative examples, looking for recurring visual patterns. The result still requires art historians. Someone has to decide what belongs in the dataset, judge the quality of the source images, account for restoration and workshop practice, compare the finding with provenance and technical evidence, and decide how much confidence it deserves. The nervousness feels familiar. A new instrument has entered a field with an old hierarchy of authority. Some specialists worry about bad methodology, weak datasets, exaggerated claims and commercial misuse. Those are legitimate methodological problems and deserve close scrutiny. Other objections boil down to the complaint that a machine lacks an art historian's humanity. So does an X-ray tube, and museums have somehow coped. There is an obvious status issue lurking here, and it would be silly to ignore it. Connoisseurship has always carried a certain glamour because the great expert sees what ordinary people cannot. Years of looking produce judgments that can be astonishingly good. They can also be wrong (I've got a whole book on that, The Art of Forgery). A tool that tests those judgments can feel irritating, especially when it produces a result that refuses to defer to reputation. Duveen's discomfort with technical authentication now looks quaint. The Sistine critics found themselves confronting a Michelangelo whose colors violated expectations built over centuries. Infrared cameras exposed drawings hidden from generations of expert eyes. Carbon dating has overturned stylistic assumptions that once felt secure. Each technology became useful enough that the field absorbed it and moved on. AI image analysis will become another item in the art historian's toolbox, brought out when the question suits it. Students may eventually find it peculiar that people once imagined a computer examining a painting as a threat to human expertise, just as they would think it odd that an x-ray machine was once considered threatening new tech (by medical doctors and art historians). Given art history's record, it's safe to bet that the experts will keep their jobs and AI will become a normal asset to help them do better research. The sturm und drang and the end result are predictable. Any historian could tell you that. Featured image: Leonardo da Vinci, Portrait of a Woman, commonly known as La Belle Ferronnière, c. 1490–1497, Musée du Louvre, Paris (INV 778).