BY JORDAN ARNOLD

High-Tech Art Authentication May Prevent Costly Litigation

THE ROBUST GROWTH IN DEMAND for investment-grade art has been accompanied by a sharp increase in litigation over questions of authenticity and provenance. This has shone a harsh light on the difficulties of conducting adequate due diligence in such a notoriously opaque and unregulated market. At the same time, several emerging technologies suggest that the dynamics of how art is created, sold, and authenticated may be due for change. Some of these technologies have enabled arms-length transactions in which works of art can be discovered, bid upon, purchased, and delivered over long distances. Others have allowed artists to tag their work at the point of creation both as a guarantee of authenticity and as a deterrent to counterfeiting. Still others are providing advanced forensic tools that can match existing artworks to their creators with a precision previously unattainable. Taken together, these new techniques and tools promise to change the very nature of due diligence in art transactions going forward.

The rise of social media has had a disruptive effect on art marketing. Instagram, in particular, has emerged as an online marketplace in which artists can display their work, dealers can market it, and collectors can discover it—all at a distance. This has, despite its benefits, increased the vulnerability of all players to sophisticated counterfeiters, fraudulent sellers, and other bad actors who thrive in online environments. Some works on Instagram have been created digitally and thus can be easily replicated by unauthorized players. Reliable ways to restrict dissemination and track ownership are now needed. But whether the artwork is digital or not, remote Instagram-facilitated transactions have brought into focus the need for a new breed of advanced authentication techniques. Several have emerged to fill the void, including four possible game-changers.

Forensic Breakthroughs

Among the most promising of these new technologies, two are forensic in that they can be used on existing works to verify their authenticity. The first, anti-forgery algorithms, uses big data and artificial intelligence methods to apply "deep learning" to the materials, compositional techniques, and stylistic signatures of the artist in question. The algorithms analyze and codify the characteristics that uniquely identify an artist in order to distinguish them from those of skilled forgers. As with all artificial intelligence, the knowledge gained is cumulative—the algorithms add information over time, constantly improving their accuracy in detecting forgeries.

Peptide mass fingerprinting (PMF) uses mass spectrography to analyze proteins at the molecular level. As animal proteins have been used for centuries in paints, adhesives, and coatings, PMF identifies the unique markers that make up the "fingerprint" of a sample, allowing works to be matched precisely to similar works by the same artist. A mismatch strongly indicates forgery.

Two other nascent forensic technologies are being applied to new works, including digital art, as effective deterrents to counterfeiting and unauthorized replication. Synthetic DNA lets artists stamp an inconspicuous tag on new works. Made from bioengineered DNA

material, this unique identifier can be scanned to verify provenance. The tag is tamper-proof—it cannot be removed without leaving microscopic evidence—and is linked by encryption to metadata about the work, its history, and its creator.

Blockchain, a transaction-recording technology commonly associated with digital currencies, is now being used to track the movement and verify the provenance of digital art. Just as every bitcoin transfer is permanently recorded in a distributed public ledger, the ownership data of digital artworks now can be permanently recorded in a similarly distributed database. From then on, all subsequent transactions are time-stamped and publicly linked to the database, confirming that the work has been properly licensed. Clear provenance is established at the creation of the work and securely tracked over its lifespan.

Simplifying Authentication

All four new technologies arrive at a time when the traditional means of artwork authentication are increasingly being tested by litigation. Settling authenticity claims has always been plagued by ambiguity, relying on the sometimes contradictory findings of two different types of experts: scientists performing forensic tests and connoisseurs making informed evaluations of the works in question. As lawsuits have grown in frequency and financial consequence, mistakes inevitably have been made and many connoisseurs themselves have been sued. This has caused a number of connoisseurship committees to withdraw from the practice, declining to render opinions that might subject them to litigation. In such a fraught setting, the ability to render a simple yes-or-no verdict based on dependable scientific indicators can greatly reduce the time, expense, and uncertainty of resolving authenticity questions.

It is now incumbent upon all players in the art field—artists, collectors, investors, gallery owners, and the lawyers who represent them—to adjust their practices in light of changing technology. The implications for due diligence are clear. While transactions involving older works will continue to rely on the laborious, time-consuming, and ultimately subjective authentication processes of the past, the path for new works will be considerably simpler. Artists should be advised to take precautionary measures, such as tagging their works and recording metadata, even at the earliest stages in their careers. Buyers and sellers should be apprised, in advance of any online transaction, of the more precise authentication techniques now available to them.

These new protections, when fully implemented, will bring a welcome measure of transparency to the entire art market, even as they dramatically reduce the time and money spent on due diligence and authentication. The ultimate promise is that transactions will be safer and more efficient, thereby raising productivity and profitability for all involved. ∎

Jordan Arnold, a former Manhattan assistant district attorney, is a senior managing director of K2 Intelligence's New York and Los Angeles offices and head of the firm's private client services.