Immersive art experiences have taken the art world by storm in recent years, attracting millions of non-museum-goers to exhibits like SuperBlue, OmegaMart and Seismique. But, as immersive art becomes successful and proliferates, questions of protecting it against copying arise. Technology-driven, participant-influenced, mixed-reality experiences can stretch traditional concepts of what copyright protects. One recent immersive art experience, the Museum of Dream Space (“MODS”) in Los Angeles, owned by a Chinese company, openly admits it was inspired by exhibits by Japanese art collective teamLab. Unsurprisingly, teamLab calls this infringement.

teamLab's original exhibit *Boundaries*, which opened at Pace Gallery in London in 2017, is on the left. MODS' *Season Dream* exhibit, which opened the following year in LA, is on the right:

Both works involve a waterfall of light particles with multicolored flowers behind the waterfall on the walls and floors. In both cases, the water and flowers interact and respond based on a participant's presence and movements. In *Boundaries*, when a person stands on the “water,” the person becomes an obstacle for the water, as though a rock were blocking its flow, and the flowers underneath begin to bloom.

MODS did not stop there. It exhibited a second work, *Galaxy Dream*, inspired by teamLab's original work **Crystal** from years earlier:

teamLab describes its work as “an accumulation of light points to create a sculptural body, similar to the way distinct dots of color form an image in a pointillist painting.” teamLab chose its specific orientation of lights within the room, primarily purple and blue colors, specific blinking patterns for the lights, and mirrors and reflective floor and ceiling surfaces to convey an illusion of infinite
lights. teamLab created a computer algorithm to control the display of the LED lights as well as a smartphone app that can be used by viewers to create further changes to the light display.

MODS’ Galaxy Dream copied the arrangement of lights used by teamLab, used similar purple and blue colors, similar blinking patterns, and mirrors and reflective floor and ceiling surfaces as in Crystal.

MODS admitted it was inspired by teamLab. In response to a social media comment, MODS wrote: “Hi there, we were really inspired by TeamLab exhibit and a lot our installations look similar. We also used it before to show how pretty their museum is and that we would love to bring this experience to USA.” MODS went further and actually copied images of teamLab’s exhibit to promote MODS’ own exhibit:

MODS also copied text verbatim from teamLab’s website to promote Galaxy Dream. teamLab’s website:

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Digital technology enables complex detail and freedom for change. Before people started accepting digital technology, information and artistic expression had to be presented in some physical form. Creative expression has existed through static media for most of human history, often using physical objects such as canvas and paint. The advent of digital technology allows human expression to become free from these physical constraints, enabling it to exist independently and evolve freely.
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Later, MODS’ website published the following copy:

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As the world goes virtual, so too must the craze of the day. Having survived the Pog and Beanie Baby pandemics, it is hard not to see history repeating itself with non-fungible tokens, better known now as NFTs. These digital creations have spread quickly throughout not only the digital world but the real-world economy as well, collecting hard currency along the way.

What are NFTs and what is their purpose, if any?

A non-fungible token is a non-interchangeable unit of data (token) stored on a blockchain, a form of digital ledger, that can be sold and traded because of its unique characteristics. Because all NFTs are one of a kind, their ownership is easily identified, incontestable and guaranteed by blockchain technology. NFTs can be both digital (pictures, GIFs, songs, videos) and tangible (deeds, tickets, legal documents and many more). If you create an NFT (sometimes referred to as “minting”), your status as the creator and owner is verified. You even can earn royalties with every subsequent transfer through Smart Contracts.

The presence of the NFT certifies that the web object, such as digital art, is unique and therefore not fungible, which means not interchangeable with some other digital file. Other people can view a copy of the work, but only the work with the NFT is the original. Therefore, the original work of digital art is non-fungible and has value because of that exclusivity.

For comparison, the Mona Lisa is one of the most valuable paintings in the world. Its provenance (the history that proves its authenticity) can be traced back to Leonardo da Vinci’s creation of it, and thus there is little doubt that the painting hanging in the Louvre is the one that da Vinci himself painted. Today, a very talented painter could create a copy of the Mona Lisa that would look exactly like the original (to a non-trained eye, anyway). But, that copy would be worth almost nothing compared to what the original is worth. That’s because no one would believe the copy was the original – we all know the original is in the Louvre. The provenance of the painting hanging in the Louvre makes that painting non-fungible, i.e., it is not interchangeable with any copy created today.

Similarly, an NFT makes a digital piece of art worth far more than any copies. It is like a certificate of authenticity and ownership that increases the value of the work. In some cases, the value of the NFT is the NFT itself, such as the NBA’s “Top Shot moments” series of NFTs, which are similar to collectable sports player cards. In other cases, the NFT itself functions merely as a certificate of authenticity and ownership for something in the real world, such as a painting, automobile, aircraft or even a house.

Some companies are using NFTs to commodify assets, build their brands and combat counterfeits already. Nike, for instance, is using its CryptoKicks to ensure authenticity of genuine pair of shoes by assigning a cryptographic token to signify the shoe’s ownership and to create additional brand value.

However, the most lucrative cryptocurrencies use an energy-intensive process called proof-of-work to validate transactions. That requires significant computing power, and therefore large amounts of electricity. In response, the private sector-led initiative, the Crypto Climate Accord, was
The term “intellectual property” refers to intangible property of the mind as opposed to property we can touch and feel, like cars and real estate. Employees and independent contractors may create intellectual property for others as part of their employment or contract terms (whether express or implied). Who owns that intellectual property? The law is fairly clear as to ownership of copyrightable works, trademarks, patents and trade secrets. But, there are other forms of intellectual property that are not covered by statutes and case law that are more difficult to protect.

Copyrights
If you are an employee and you create copyrightable works within the scope of your employment and on your employer’s dime, then the employer owns the copyrights under the Work for Hire doctrine. The employer is considered the author of that work. If you are an independent contractor creating the copyrightable work, then you are the author and owner unless there is a written agreement stating otherwise, i.e., a contract expressly stating that the employer owns the copyrights in your work.

Patents
Inventions are subject to the Hired to Invent doctrine, which means if an employer hires an employee to invent something and the employee does so, then the employee must assign any resulting patent rights to the employer. Independent contractors own their patents unless there is an agreement otherwise. The agreement doesn’t have to be in writing but, of course, you must prove it exists if you want to enforce it. In other words, the agreement to assign the patent to the employer can be a verbal agreement, not a written one. But, that often leads to a he-said-she-said situation: one side saying there was a verbal agreement and the other side saying there wasn’t. So, if one party to a verbal contract wants to enforce their rights, they need to prove the verbal agreement existed, perhaps by supporting emails, voicemails or witnesses.

Trade Secrets
Trade secrets created, or simply known, by employees or independent contractors (it doesn’t matter which) belong to the employer provided that the employer (1) takes reasonable steps to maintain their secrecy and (2) there is economic value to keeping them secret. These are things the employer’s competitors would love to know but because they are kept secret the employer has an advantage in the marketplace. Trade secret misappropriation is where an employee or independent contractor knowingly takes the company’s trade secrets and then competes with the company, whether on their own or by working for or with a competitor of the company. However, a former employee may use the general knowledge, skills and experience acquired during their prior employment to compete with a former employer. So, the center of a trade secret misappropriation dispute often revolves around whether the information taken was a “trade secret” or simply the ex-employee’s acquired "general
Trademarks
A trademark (a word mark or a logo) belongs to the entity that is using the mark in commerce. So, absent an agreement to the contrary, the company that is selling goods and services under the mark owns all rights to the mark, regardless of who created it. The exception would be where there is an agreement, probably a license agreement, stating that one person has created the trademark logo and gives the company the right to use it, usually in exchange for a fee. The license agreement should be in writing and here’s why: If a company hires a graphic designer to create a logo without a written agreement, the company has an implied license from the graphic designer to use the mark and logo. However, the implied license is non-exclusive so the graphic artist would be free to license the logo to another entity. Avoid that kind of confusion by getting a written agreement clearly stating who owns the logo design after it is created.

Other IP:
There can be other intangible property that employees and independent contractors create for employers. It may be referred to as generic “intellectual property” or “know-how.” There is no actual tort called “Intellectual Property Theft,” although the term gets bandied around as a threat when none of the legal protections above are available. But, if a lawsuit for intellectual property theft is filed, it would probably be characterized and treated as a claim for ordinary negligence.

Ordinary negligence happens when a reasonable person would have foreseen that their acts would create an unreasonable risk of injury to another person or their property. All of us have a duty to exercise ordinary care for the safety of other people and their property, including their intellectual property. For example, say an employer brings on an employee or contractor to take the lead in starting up a business and promises, in a handshake deal, profit-sharing in return. If the employer then lets the employee create the concepts, assemble the team, approve the logo design, use their industry contacts to generate buzz, etc., and then fires them as soon as the business becomes profitable, that could be negligence. In other words, the employer should have exercised ordinary care for the employee's intangible contributions and not stolen it from them instead. This is a situation where the other intellectual property protections discussed above are difficult to apply but you know instinctively that the employer shouldn't have done that. An ordinary negligence claim may be the best, or even only, way for the employee or independent contractor to seek a remedy for the wrongful conduct of the employer.

Gina T. Constant is a sole practitioner with Constant Law, LLC. She brings 20 years of professional experience to her law practice, applying real world experience to each legal issue she approaches. Ms. Constant practices primarily in the areas of litigation, aviation, and intellectual property, specifically, patent, copyright, and trademark law. She is a registered patent attorney.

Brave New World: NFTs, Cryptocurrency and More

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Advances in computational approaches and access to large amounts of data afforded by the growth of the internet in the late 20th century through the present have finally enabled the emergence of machines that practice intelligence and can learn from experience. The advent of such artificial intelligence (AI) and machine learning (ML) has brought about myriad practical innovations and applications, from automated assistants like Siri to autonomous vehicles.

As with any useful technology, with developments resulting in an explosive increase in capabilities innovators increasingly have used AI and ML in new and non-obvious creations. The desire for exclusive rights by developers working with these technologies often finds itself at odds with patent offices and courts. Legal developments concerning artificial intelligence and machine learning inventions will shape associated intellectual property rights for decades to come, with consequent effect on how these powerful technologies are developed, commercialized and adopted. Capabilities of advanced artificial intelligence further raise questions regarding the nature of creative conception itself.

**What is Artificial Intelligence? What is Machine Learning?**

Artificial intelligence, by definition, is intelligence demonstrated by machines, as opposed to the natural intelligence displayed by animals including humans. This is not useful definition assumes that “intelligence” is a well-understood term. The term can loosely apply to an agent that perceives elements in its environment and takes actions that maximize its chance of achieving certain goals. The related field, machine learning, encompasses methods that leverage data to improve performance on some set of tasks. In this article, I will refer to both areas of technology (crudely) as AI.

**Artificial Intelligence as a Patent Claim Element**

More and more, inventors are developing inventions based as least in part on AI because of the power provided by these tools. For many of these inventions, patent practitioners need to incorporate AI as an element in article and apparatus claims, and as a step-in process claims. In the U.S., the principal pitfalls in doing so arise under 35 U.S.C. §§ 101 and 112.

**Patentable Subject Matter and Artificial Intelligence**

While statutory patent law provides that inventors may obtain a patent for a new and useful invention, the judiciary has created exceptions to patentability for certain kinds of inventions, in particular inventions that are laws of nature, natural or physical phenomena and abstract ideas, “for such things are the basic tools of scientific and technological work”. Because AI is principally computation, artificial intelligence is an abstract process. Patent claims relying on artificial intelligence, without more, are highly likely to face rejection by the Patent Office as directed to unpatentable subject matter in the form of abstract ideas.

Guidance provided by the U.S. Supreme Court and by the Patent Office regarding patent subject matter eligibility is clear as mud, in this author’s opinion. However, a patent claim which recites only abstract ideas such as computation, analysis, detection and the like will probably not be saved from rejection by including an element or a step involving artificial intelligence. In the same vein, a patent claim not directed to an abstract idea as a whole is likely not to be regarded as directed to unpatentable subject matter even if it includes the operation of artificial intelligence. Nota bene, however, that if the only distinction between the claim and the prior art is the use of artificial intelligence, the claim may fail for lack of novelty under 35 U.S.C. § 102 or § 103.

**Written Description and Enablement**

“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.” 35 U.S.C. 112(a).
Implementations of AI involve complex computational operations, generally on large volumes of data. Claims directed to artificial intelligence related inventions must have sufficient support in the disclosure of the invention to enable others to practice the invention. Patent practitioners are well-advised to exercise the level of care in preparing the specification of the invention they would use in any other highly developed technological art.

To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention.5

As a practical matter, the applicant needs to make it straightforward for the patent examiner to understand how the invention works. An AI agent should not be inserted merely as a decision-making element of a claim, for example, without details in the specification as to how the agent is trained to make the decisions. I note from personal experience that, when it appears the examiner is considering rejection under section 101 but doesn't choose to provide support for such a rejection, the examiner will turn to section 112(a) to justify rejection. AI is recondite stuff. As practitioners, we have to draft the specification to educate the examiner (and, if the patent is litigated, the trier of fact).

**Artificial Intelligence as an Inventor**

In August 2019, the artificial intelligence researcher Stephen Thaler announced two applications for patent filed in the U.S. and a dozen other countries on behalf of an AI inventor he named DABUS (for “Device for the Autonomous Bootstrapping of Unified Sentience”).6 The effect was disruptive and profound.

The Patent Act gives the inventor the right to obtain a patent for a new and useful invention.8 Under the Patent Act:

“The term 'inventor' means the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention.”

Adroitly sidestepping whether DABUS had actually “invented or discovered” the subjects of these inventions, patent offices and courts have focused on whether DABUS is an “individual” as contemplated by the legislative and regulatory frameworks of their jurisdictions to determine whether these applications were entitled to examination for patenting. Most patent offices rejected the DABUS applications as not providing an “individual” as an inventor.10 Thaler appealed rejections to the courts.

Ultimately, when adjudicated, the decision has been that the DABUS applications are not entitled to examination because the applicable law requires that an inventor be a human being. Typical of such decisions is that of the Court of Appeals for the Federal Circuit regarding the U.S. application:

“[T]he Patent Act, when considered in its entirety, confirms that ‘inventors’ must be human beings.”11

Citing *Univ. of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.*, 734 F.3d 1315, 1323 (Fed. Cir. 2013) and *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993), the court stated:

“The two cases confirm that the plain meaning of “inventor” in the Patent Act is limited to natural persons.”12

So, at least for the present, patents cannot be obtained for inventions created by artificial intelligence, depriving the world of disclosures of new and useful technological improvements. A proposed solution, that of designating the programmer of the AI as the inventor, is (in this author’s opinion) mere sophistry: it is the equivalent of designating Samuel Ogden Edison Jr. (Thomas Alva’s father) as the inventor of the light bulb. As AI capabilities continue to emerge, verging more and more on sentience, it is my belief that a more satisfactory solution will be found to the problem of AI inventors.

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**Endnotes**

1 A search of the U.S. Patent and Trademark Office database revealed 6096 patent applications using the term “artificial intelligence” in the abstract of the disclosure (9/8/2022, 18:45:00 UTC)

2 *Alice Corp.*, infra at 216.


4 MPEP 2106 Patent Subject Matter Eligibility [R-10.2019]


7 EP3564144A1 - Food container - Google Patents - The Food Container disclosure is really just about a container for food or beverages whose exteriors are shaped in the well-known snowflake fractal design commonly called the Koch curve. The large surface area-to-volume ratio of the container maximizes heat exchange. The shape of containers is such that they can be interconnected.

8 EP3563896A1 - Devices and methods for attracting enhanced attention - Google Patents – This disclosure is directed to providing a pulsating light source with a particular pattern of frequencies that are putatively operative to trigger specific responses in the brain of a human perceiving the pulsating light, enhancing the human’s attention. It is of interest that the disclosure cites research papers written by Stephen Thaler.

9 35 U.S.C. §101

10 The outlier is the South African Patent Office, which accepted the DABUS application as serial number 2021/02342 on 24 June 2022.


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teamLab sued MODS. MODS asserts it has done nothing wrong. It argues both a technicality relating to whether teamLab’s work needed to be registered or was exempt from registration as a foreign work, as well as a substantive defense that teamLab’s work has no copyright protection because it does not satisfy copyright’s “fixation” requirement. Copyright protection exists only in original works of authorship that are “fixed in any tangible medium of expression.” 17 U.S.C. § 102. The work must be “sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.” 17 U.S.C. § 101. Copyright protection does not exist for a “process, system, . . . [or] concept.” 17 U.S.C. § 102.

A federal district court recently ruled against teamLab on the technical issue, which teamLab intends to appeal. But the substantive issue of fixation remains undecided. Are Boundaries and Crystal sufficiently fixed in a tangible medium of expression under the Copyright Act? MODS argues that Crystal Universe varies from one installation to another and varies in indefinite and unpredictable ways because its appearance is determined by the position of viewers in the installation, as well as the light renderings they select through the smartphone app. When MODS sought discovery as to the location of the physical elements of Crystal Universe, should the work need to be recreated or inspected, teamLab said “engaging in such a feat may not ultimately result in the same work being faithfully reproduced.”

Endnotes

1 A video of Boundaries is available at https://www.youtube.com/watch?v=bqDeXfWKb-k, which provides greater context for the work than is perceivable from the photograph in this article.

Ben Allison co-founded Bardacke Allison LLP in Santa Fe, where he represents creators of immersive art.

Breanna Contreras serves as Vice President of Legal at Meow Wolf, Inc. and advises the business on intellectual property matters. She previously worked with Ben at Bardacke Allison. Both are graduates of Notre Dame Law School.