Copyright Vulnerabilities in NFTs

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Many NFT and DAOs are designed to provide new or more convenient ways to own and sell creative works. Beeple's EVERYDAYS: The First 5000 Days sold at auction for $69 million. Some observers think that the Bored Ape Yacht Club's spectacular rise is due to its permissive copyright approach. Some artists and developers are diving in head-first.

But at the same time, many of these projects have run into copyright trouble due to confusion about how copyright applies to NFTs:

- When the SpiceDAO bought a copy of the lavishly illustrated pitch book that director Alejandro Jodorowsky made for a never-filmed version of Dune

, some participants hoped that buying the book would allow them to bring Jodorowsky's vision to the screen. But this plan was quickly scrapped when owners of the Dune

copyrights vetoed the idea.

- "Right-clickers" save JPEG copies of the artwork from popular NFTs. The owners of those NFTs say this is copyright infringement. Only one of the two can be right.
- Quentin Tarantino and Miramax are locked in litigation over the rights to Pulp Fiction

NFTs.

- Too many NFTs to count use stolen art.

We hope in this blog post to clear up some of the confusion around NFT copyrights, and to help people working in the space understand the challenges of fitting NFTs to the framework of copyright law. Our bottom line is simple: ownership of an NFT can be used to give the owner substantial control over a creative work, but that control is not automatic. Copyright law does not give an NFT owner any rights unless the creator takes affirmative steps to make sure that it does. Our survey of some existing NFT projects and their licenses reveals that very few of them take all of the necessary steps needed to make NFT copyrights behave the way that community members expect. Thinking through the legal issues should be part of the NFT design process, not an afterthought.

On-Chain and Off-Chain Assets

When talking about blockchain assets, it is common to say things like "Alice owns 10 Bitcoin." Most of the time, it is clear what this means: Alice controls the private key to a blockchain address that has been transferred 10 Bitcoin in unspent transaction outputs. Alice, if she wishes, can use that private key to transfer those Bitcoin to another address. (Alice might control the key directly or via a wallet; we will ignore this complication in what follows.) In the words of the current draft Uniform Commercial Code article for blockchain assets, Alice has "the power to avail [herself] of substantially all the benefit from" those Bitcoin. For more complicated assets, like an NFT controlled by a smart contract, this control might take the form of knowing the private key needed to initiate a transaction transferring control to someone else.

This case is easy because Bitcoin and smart contract tokens are on-chain assets

. They exist entirely as entries on a blockchain. Matters are more complicated for off-chain assets

, in which an entry on a blockchain is used to represent something that exists somewhere else, like a tungsten cube. The cube itself

is a physical object that exists in the physical world. It weights 2,000 pounds, measures 14.545 inches on a side, and sits in the Willowbrook, Illinois warehouse of Midwest Tungsten Service. But the Tungsten Cube NFT

is an entry in a smart contract deployed on the Ethereum blockchain using theERC-1155 standard. If Alice buys the Tungsten cube NFT from TungstenDAO, the physical cube will still be sitting in Willowbrook, Illinois.

Although the Tungsten Cube NFT is not the same

as the physical tungsten cube, the two are connected

. According to the “Description” provided by TungstenDAO to OpenSea when it created the NFT listing, when Alice acquires the NFT, she is also entitled to “One visit to see/photograph/touch the cube per calendar year.” If Alice sends the NFT to a special address that prevents anyone from ever controlling the NFT again (a process called burning), she is entitled to receive physical possession of the cube “via freight truck.” If she sells the NFT to Bob, then Bob will be entitled to visit the cube once a year, or to burn the NFT and receive the cube. Some lawyers call this connection “tethering”: rights in an off-chain asset (the physical cube) are linked by an invisible tether to an on-chain asset (the NFT). (In theory, at least. Some legal scholars are skeptical about whether tethering actually works.)

Thus, there are actually three different kinds of assets involved in an NFT. Yes, three.

First

, there is an NFT itself on the blockchain. It looks like this:

You can view the creation of this NFT online on the Etherscan blockchain explorerhere .

Second

, there is the physical cube in a warehouse. It looks like this:

Third

, there is the legal right to control the physical cube. It looks like this, because legal rights are intangible and have no physical existence:

If everything works correctly, the legal right is what links the on-chain NFT to the off-chain cube. The current owner of the NFT is able to control the physical cube because they also own

the associated legal right.

A Copyright Primer

The following quote is sometimes (humorously but incorrectly)attributed to Albert Einstein:

You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat.

A copyright is exactly like a tungsten cube except that there is no cube. A tungsten cube is a specific physical object. It exists in one place. Any other tungsten cube is a different cube. But a creative work like a photograph or a story is intangible. It can exist in exactly one object (called a “copy”) like an oil painting on a canvas. Or a work can exist in many copies at once like when a publisher prints thousands of copies of a book, or when a photograph is displayed on millions of computer screens. Or a work can exist in no copies at all, like when one person tells another person a story. The point is that a creative work is not the same as any of the copies that embody it.

Thus, the copyright in a creative work behaves differently than ownership of a physical object, like a tungsten cube. The owner of the cube can move it, sculpt it, or melt it down; if someone else does any of these, they violate the owner’s property rights. But the owner of a copyright isn’t necessarily the owner of any specific copies. If Alice buys a copy of Bob’s novel, Alice owns the physical copy — the paper with ink marks on it — but Bob owns the copyright in the words.

Instead, Bob’s copyright consists of a limited set ofexclusive rights. Most importantly, Bob can prevent anyone, including Alice, from making more copies

of his novel. (That’s why it’s called a “copy” “right.”) If Alice wants to make a movie adaptation of Bob’s novel — in copyright terminology, a derivative work — she needs Bob’s permission. She can get it in one of two ways. Either she can buy the copyright outright from Bob — a transfer of ownership

— or Bob can retain the copyright and give Alice alicense

to make the movie. The difference is that if Alice becomes the new owner via transfer, she can now decide whether to authorize other uses, like graphic novels and action figures. If Bob merely gives Alice a license, he retains the authority to decide how else to use (or not) the copyright.

NFTs, Copies, and Copyrights

Back to NFTs. It should be apparent now that an NFT can be tethered to a creative work in one of two ways. First, it could be used to control a copy

of the work: just like whoever owns the Tungsten Cube NFT is entitled to possession of the tungsten cube, whoever owns the Physical Copy NFT is entitled to possess a specific copy of the work. Second, it could be used to control the copyright

in the work: whoever owns the Intangible Copyright NFT is now entitled to decide who gets to make new copies. The two could go together, but they don't have to

.

This is where the more ambitious hopes for the SpiceDAO went wrong. The project bought and tokenized ownership of one physical copy of Jodorowsky's pitch book. The owners of SPICE tokens can (collectively) decide to sell or lend it to others, or put it on public display offline. But they never had, and couldn't tokenize, ownership of the copyright in the underlying creative works. The copyright in Dune

the novel is still held by Frank Herbert's estate, which licensed film rights to Legendary Entertainment, which produced the 2021 film version; the copyrights in the artwork in the pitch book are held by the original artists and their estates.

Another failure mode for NFT copies is that copyright law has an unintuitive concept of what counts as a copy

. We have been talking about obviously distinct physical things, like printed books. But "copies" under U.S. copyright law include any "material objects … in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device." This definition includes hard drives and SSDs, and sometimes even RAM. Every computer that interacts with the work makes a separate "copy" for copyright purposes; even just browsing to a webpage makes a "copy" of the images on it on your computer. Thus, for all practical purposes any NFT that includes digital artwork must

include some copyright interest (either a transfer or a license) or the owner of the NFT will become an infringer the moment they attempt to do anything with the artwork.

In particular, it is not

sufficient to give an NFT purchaser a copy of the artwork. U.S. copyright law explicitly states that transfers of copyrights and transfers of copies are different:

Transfer of ownership of any material object, including the copy or phonorecord in which the work is first fixed, does not of itself convey any rights in the copyrighted work embodied in the object; nor, in the absence of an agreement, does transfer of ownership of a copyright or of any exclusive rights under a copyright convey property rights in any material object.

If you buy an oil painting from an artist, you don't also receive ownership of the copyright. Yes, you own the original, but the artist retains the copyright, and they can sell prints of it if they like. If you want to buy the copyright too, you'll need to get a separate agreement. The same is true for NFTs. Unless an NFT explicitly gives owners copyright

interests as opposed to just access to the artwork, owners should not assume that they have any rights to use the artwork or to stop others from using it.

Some popular NFT projects, including the CryptoPunks, have been released with no explicit copyright terms. This is legally risky for all concerned. An adversary could approach the NFT creator, buy out the copyright to the artwork, and then sue NFT purchasers for infringement if they put the images in their profile pictures, on OpenSea listings, etc. This is not the intent of the creators and purchasers, and we hope that courts would not cooperate in a copyright-based attack like this, but without clarity around the copyright rights of NFT owners, there is a risk that it could happen. (The courts are not known for their nuanced understanding of cutting-edge blockchain technologies and community norms.)

Following the initial CryptoPunks launch, its creator, Larva Labs, later went back and tried to retroactively add a copyright license. Some legal scholars are skeptical whether this works. Even more recently Yuga Labs acquired the rights to the CryptoPunks and announced its intention to grant commercial rights to token owners. While many CryptoPunks owners will welcome this change, changing license terms after the initial launch and minting is trickier than granting them up front.

Even more blatantly, some NFTs create copyright trouble by using artworks stolen from artists, or famous works that the NFT creators have no connection with and no license from. Copying these works as part of the NFT marketing (e.g. for OpenSea listings) can be copyright infringement. In addition, an NFT creator could be engaged in false advertising by implying that NFT owners will receive rights in these stolen works. Indeed, because copyright infringement is "strict liability," NFT owners who make copies of stolen art could also be liable for infringement, even if they were misled by the NFT creator into thinking that it was properly licensed.

While straight-up scam artists are unlikely to care about infringement, it is unfortunate that many well-meaning projects also seem to believe that minting an NFT of a work somehow automatically brings with it some copyright interest in the work.

One particularly tragic example is Andy Williams, who created an NFT of TV video footage depicting his daughter's murder. Parker was apparently advised that creating an NFT would give him enough of a copyright in the footage to have it removed from sites like Facebook and YouTube. But copyright doesn't work that way. The television station that filmed the footage owns the copyright. Parker can't change that by minting an NFT of it.

Another related myth of NFTs is that minting one helps enforce copyright against infringers. The Associated Press's Director of Blockchain, for example, has argued that creating NFTs of some of its photographs would make it easier to make unauthorized users take them down. But copyrights come from copyright law, not from the blockchain. The process to file a copyright lawsuit or a DMCA takedown notice isn't made any easier by having an NFT of the work. To be sure, in a Web3 future where absolutely everything is on the blockchain and nothing is possible unless it is approved by a blockchain transaction, it would be technically impossible to post a photograph without an explicit license from the copyright owner. But first, that world is not the world of today, and second, a world where speech is impossible without advance permission would be profoundly dystopian. It would run completely against the values of freedom and openness that blockchain is supposed to stand for.

Copyright Transfers Are Hard

Actually ensuring that NFT owners have the copyrights they think they do is also a subtler problem than it appears. Consider the following passage from the Bored Ape Yacht Club Terms & Conditions:

i. You Own the NFT. Each Bored Ape is an NFT on the Ethereum blockchain. When you purchase an NFT, you own the underlying Bored Ape, the Art, completely.

This looks like it tethers ownership of the copyright to ownership of the NFT. Suppose that Woodchuck Labs uses these terms for its WoodChuckers NFTs. When Alice buys a WoodChucker NFT, she acquires the copyright. When she sells the NFT to Bob, he acquires the copyright. In copyright terms, there is a transfer of copyright ownership to Alice when she buys the NFT, and then another one from Alice to Bob when she sells him the NFT. Full ownership of the copyright lets Alice use the artwork — e.g. to display in her Twitter profile inside a hexagon. It also lets her sue for infringement, if she wishes, any right-clickers who download and display the artwork.

Unfortunately, copyright doesn't work this way

. The problem is that U.S. copyright law sets a high threshold for what it takes to transfer ownership of a copyrightSection 204(a) of the Copyright Act states:

A transfer of copyright ownership, other than by operation of law, is not valid unless an instrument of conveyance, or a note or memorandum of the transfer, is

in writing and signed by the ownerof the rights conveyed or such owner's duly authorized agent. (emphasis added)

The writing part isn't a problem; the terms on the website count as a "writing" underfederal law. The bigger issue is that the BAYC terms aren't "signed" by the copyright owner, Woodchuck Labs. Without a signature, it is not possible to pass ownership of the copyright to Alice.

In theory, Woodchuck Labs could fix the lack of a signature at this first step by modifying the terms to add a signature line. Under the E-SIGN Act, even a digital signature like a person's name printed in a script typefacecan be a "process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record

" (emphasis added). Indeed, courts have held that clicking "I agree" to a website's terms when you create an account is enough to show the "intent to sign." (There are some timing issues, like the ones with the CryptoPunks relicensing, but that's an issue for another time.)

Unfortunately, there is a bigger problem. It arises when Alice decides to resell the WoodChucker to Bob. The intent of the BAYC terms is that Bob now owns the copyright and Alice doesn't. But thanks to the signature requirement, that's not what happens. There is no signed transfer of copyright from Alice to Bob

. Without a signed transfer, Alice still owns the copyright, not Bob.

This is where the difference between smart contracts and legal contracts rears its head. Bob might try to argue that Alice has agreed to the BAYC terms, which make him the copyright owner. But Alice hasn't! As far as she's concerned, the BAYC terms are just a bunch of words on a website somewhere. The copyright system wasn't created with digital tokens in mind and doesn't know about them. As far as it's concerned, Alice owns the Woodchucker copyright and hasn't done anything to give up ownership. Legal contracts typically only bind the people who explicitly agree to them.

True, Alice has has invoked an ERC-721 smart contract transferFrom()

method to transfer the Bored Ape to Bob and applied her cryptographic signature to the smart contract transferring the NFT to Bob. But that method is a smart-contract

term, not a legal-contract

term. The smart contract doesn't say anything about copyright or link to the BAYC terms. Even if it did, there would be no guarantee that Alice had read or even knew about those terms. She would not have attached her cryptographic signature to a transaction "attached to or logically associated with a [legal] contract ... with the intent to sign" it in a legally binding sense.

Getting from smart contract to legally binding terms is a hard and subtle problem. Adding off-chain assets like tungsten cubes and copyrights into the mix makes it even harder. Changing ownership of these assets requires off-chain effects, but since smart contracts exist on the blockchain, it is entirely possible to interact with them without ever invoking any additional contract terms. If copyright in an NFT-linked artwork is based on a legal contract, users who deal only with the smart contract have a decent argument that nothing in the legal contract applies to them, since they only interacted with the smart contract.

An Alternative: Copyright Licenses

There is another way to structure NFT copyrights that avoids the signed-writing problem. Instead of a transfer of ownership

, which passes full copyright ownership to each owner of the NFT, the NFT creator could use a copyright license

. The creator holds on to ownership of the copyright, and gives a license directly to each successive NFT owner.

At first glance, this looks more complicated, because now the creator must deal directly with every NFT owner, rather than just with the first owner. But it has a substantial advantage, which is that copyright licenses don't need to be signed the way that copyright transfers do. (Indeed, they don't even need to be in writing, although for any economically serious transactions, writing down the terms is much safer.) Carol and Woodchuck Labs don't need to rely on Alice and Bob to get the signed transfers right. Instead, Woodchuck Labs can simply write its terms so that it directly gives a license to every NFT owner automatically

as soon as they acquire the NFT.

There are good precedents for this approach in free and open-source software licensing. The GNU General Public License, for example, says:

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

And the Creative Commons Attribution license says:

Every recipient of the Licensed Material automatically receives an offer from the Licensor to exercise the Licensed Rights under the terms and conditions of this Public License.

A clear example of this approach in the NFT space is the RTFKT license, which states:

1 … Any digital works of authorship or other content made available through the Platform to an owner of a Digital Collectible that is intended as an "Additional Benefit" (as that term is defined in the Digital Collectible Terms) will be identified as such on the Platform or at the time of download. Any such content will be licensed to you for as long as you own the applicable Digital Collectible pursuant to the terms of any license presented at the time of download or, if no such terms are presented, pursuant to the applicable Digital Collectible Terms as Related Content for that particular Digital Collectible. …

The details are tricky, and this is not meant to be a full legal analysis. Our points are just that NFT creators need to give serious thought to how they structure their terms to ensure that NFT owners actually receive the necessary copyright licenses to NFT-linked artwork, and that copyright licensing is far easier to make work than an outright transfer of ownership.

Derivative Rights

Another difficult issue concerns derivative works — i.e., "a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted." No one can explain why the Bored Apes achieved cultural and economic escape velocity. It will forever be one of the mysteries of the ages. But one factor, at least, is sometimes said to be that the Bored Apes terms allow owners to make more extensive derivative works based on them. While the NFT license allows owners to use the art for their own "personal, non-commercial use" and for projects earning up to $100,000 per year, the BAYC terms allow unrestricted commercial use of the artworks. Specifically, "Yuga Labs LLC grants you an unlimited, worldwide license to use, copy, and display the purchased Art for the purpose of creating derivative works based upon the Art."

The first problem here is that this license grant is inconsistent with the statement, just two paragraphs above in the BAYC terms, that "[w]hen you purchase an NFT, you own the underlying Bored Ape, the Art, completely." If Alice really does "own" the art "completely," then Yuga Labs has nothing left to give and the commercial-use license is superfluous. (This is another

sign that the statement that Bored Ape NFT owners “own” the artwork, like many other claims about what users actually own when they “buy” content online, cannot be taken at face value.)

The second problem is that this term does not play nicely with downstream transfers. Consider Alice and Woodchuck Labs again. Suppose that Alice owns WoodChucker number 12345. She allows Fern, a a filmmaker, to create a video series based on WoodChucker 12345. Those videos are derivative works under copyright law and Fern has their own copyright in the videos. Now Alice decides to sell WoodChucker number 12345 to Bob. What should happen to Fern’s license?

One simple answer would be that since Alice’s copyright license to use WoodChucker 12345 terminates when her ownership of the NFT does, so do any sublicenses she has granted. That would mean that the videos stop being licensed the moment Alice sells to Bob, and Fern becomes a copyright infringer if they continue to show the videos! This is terrible from Fern’s perspective, having invested time and money into making the videos. It’s also terrible from Alice’s perspective, because Fern ought to be very reluctant to pay money to license Alice’s rights if Alice can always back out by selling the NFT to Bob. So this solution effectively makes the derivative work rights unmarketable.

Another answer would be that Fern’s license continues in full force. Bob has no ability to call backsies once Alice has given Fern a license. This protects Fern, and thereby protects Alice’s licensing business. But it creates its own headaches. For example, Bob might grant his own video license to Georg, so now there are two competing WoodChucker 12345 series. Fern will be furious, but what can they do about it? If their lawyers are good, Fern will have insisted that Alice make the video license exclusive, so that Alice can no longer license anyone else to make a video series. But this is a private contract between Alice and Fern. Bob didn’t sign it, and isn’t bound by it! Bob got his copyright license directly from WoodChucker Labs, without the exclusivity limitation that Alice promised to Fern.

So maybe the licenses ought to travel with the NFT itself. This happens all the time with real estate. If Alice owns a parcel of land and grants Telecorp an “easement” to run a fiber-optic cable under one corner of her land, the easement will still exist after Alice sells the land to Bob. It is said to “bind the owner’s successors” or to “run with the land.” That is the easement is attached to and limits (or “burdens”) the legal right to the land itself. It is not just a personal promise from Alice to Telecorp. When Bob buys the land from Alice, he steps into her shoes. He succeeds not just to her rights in the land (e.g. to build a house or grow crops), but also to her obligations (to allow Telecorp to continue to operate the cable).

Similarly, we could imagine that when Bob buys the NFT from Alice, he steps into her shoes. He succeeds not just to Alice’s rights in the Bored Ape 12345 copyright (such as the right to make glossy art prints), but also to any limitations or obligations Alice has taken on (such as the exclusive video license to Fern). Now Bob is not free to to license Georg to make a second video series.

Perhaps this is a good solution. Or perhaps not. If Alice is now free to encumber the artwork copyright in this way, it limits Bob’s rights. When he buys the NFT, he buys something less than the full rights Alice bought. Alice has carved up the copyright, and in effect kept a slice for herself. If Bob is in the NFT market, he will have to investigate the entire chain of title of the NFT he is buying to make sure that no Alices before him have quietly given away part of the copyright. This need for investigation runs contrary to the crypto ethos that as much as possible should be done in public and on-chain. So maybe exclusive licenses entered into by one owner should not

run with the NFT.

So far, we have enumerated three different possibilities for what happens when Alice sells the NFT to Bob:

1. Fern’s license terminates.
2. Fern’s license continues, but Bob can license the same rights to Georg.
3. Fern’s license continues, and Bob cannot license the same rights to Georg.

It is possible to imagine a court adopting any of these three outcomes. Indeed, there is no clear consensus as to which of these is the best solution in general. (The three authors of this blog post don’t even agree!) Even worse, these don’t even exhaust the possibilities. A fourth possibility is that Fern’s license to create new

derivative works terminates, but that they can continue to use existing

derivative works they have already created. This is how copyright lawdeals with some license terminations. Or if Fern’s license continues, what should happen to any royalties that Fern has promised to pay Alice? Should Bob succeed to those too? There are arguments in favor, and arguments against.

Our point is just that these are issues that an NFT license allowing derivative works needs to deal with. Otherwise, NFT owners and their business partners may be unpleasantly surprised by the results. Everyone who does a project based on an NFT that does not answer these questions is putting an immense amount of faith in the courts to get things right if the deal goes sour and the parties end up suing each other. (And blockchain advocates are not generally known for their faith in the courts to get things right.)

We are not saying that there is a best solution for all projects. (This is one reason among many that we are not providing our own proposed license text.) What is right for the Bored Apes may not be right for an NFT project based around musical works, or on a literary work. Instead, we think that NFT creators need to think about these issues, discuss them with their

communities, and then communicate clearly how copyright licenses will work in relation to the NFTs.

Conclusion

It is clear that many NFT projects are designed

to transfer copyrights along with ownership of the NFT itself. This is a core design goal, on the same level as creating compelling content and making transfers irrevocable. Despite this, many projects seem to have put far less thought into the legal aspects of their designs than into the technical and artistic ones.

We think this is a major mistake. The legal infrastructure on which blockchains run is just as complicated and full of traps for the unwary as the technical infrastructure. While some cryptocurrency and Web3 projects are intended to escape the existing legal system, or to replace it entirely, the same is not true of many creative NFT projects. They are intended to work within the legal system as it currently exists, to allow people to create new and interesting art now

, and to commercialize it using real-world contract, property, and copyright law.

Some existing NFT licenses are not fit for purpose. They do not make copyright interests travel along with the NFTs in the way that they intend. If code is law, then these licenses are buggy code. Responsible NFT creators would not launch a project built atop a smart-contract library that had known unpatched vulnerabilities. They should bring the same care to the legal code

on which they depend, because otherwise the results could bejust as catastrophic. Whatever you think about NFTs, launching them with broken copyright licenses doesn't do anyone any good.