3D Printing and the Potential Dichotomy Within the Copyright Act

3D scanning and printing have been creeping into modern society slowly but surely. Now the pendulum has begun to swing and soon our culture is going to be revolutionized yet again. Like all new technology that spurs a cultural evolution, these technologies will inevitably spark legal analysis and potential change. In consideration of what is to come, I was fortunate to be part of a team of individuals led by an Art and Design Researcher. We used these 3D technologies to gain first-hand experience, and to gauge the possible legal ramifications that could stem from their further development. Given the visual and artistic aspects of the technology, it will likely soon be on the cusp of potential copyright questions. After working with the technology for several months, I kept coming back to a dichotomy already present within the Copyright Act: Fair Use and the Artist’s Exclusive Right to Derivative work.

I. Copyright Basics

Let’s start with the basics – copyright protection is an exclusive right afforded to an original creator of any work that can be perceived, reproduced, or otherwise communicated, regardless of whether it has been officially registered with the U.S. Copyright Office. Once an author has created a work and the work is fixed in a tangible medium, copyright protection is attached. The Copyright statute defines works of authorship in numerous categories. However, 3D scanning will be primarily concerned with the category of literary works, which includes software, and 3D printing with those of pictorial, sculptural, and architectural works. Copyright protection prohibits unauthorized reproduction of an original work, however, there are exceptions.

One of the most prominent of these exceptions is the statutorily affirmative defense that gives another the right to Fair Use of a copyrighted work. If such a work is used for the
purposes such as such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, that use may not infringe on the original author’s exclusive rights.\textsuperscript{4}

There are four main factors that must be weighed in determining whether Fair Use applies: (1) the purpose and character of the use; (2) the nature of the copyrighted work; (3) the portion used in relation to the whole original work; and (4) the potential market for or value of the work.\textsuperscript{5} These factors must be considered together in a balancing test, and in consideration of the Copyright Act’s goal of “promoting the Progress of Science and useful Arts.” The ultimate test in weighing these factors is if this goal would be better met by allowing the use as Fair Use or preventing it.\textsuperscript{6}

Through interpretation of these factors, the Supreme Court imported a “transformative” use element into the first factor.\textsuperscript{7} In consideration of the purpose and character of the use by a second author, it must be considered whether and to what extent the original copyrighted work has been transformed.

II. 3D Printing and Transformative Use

This presents a myriad of potential questions pertaining to 3D printing. This new technology, by name, adds another dimension to the representations available through the medium of photography. I understood it as a step further than the commentary made by surrealist Rene Magritte in his famous painting “La trahison des images.” The painting depicts a pipe, yet below it states in French, “this is not a pipe.” While at first appearing contradictory, the statement is quite true: it is a depiction of a pipe; after all, you can’t smoke out of it. However, the extra dimension of 3D printing would allow one to scan a pipe, and print it in the same material, which would allow one to use it for its original intended purpose. (Question: Magritte
was making art. Can you rephrase the above paragraph to reflect how 3D scanning a pipe as an artwork that connects back to the concepts of Magritte’s painting, yet paradoxically can still remain functional?

Therefore, 3D prints have the capacity to be exact replicas of the original copyrighted work. The distinction that is so imperative is that 3D prints will likely have to be transformed to a large extent to avoid infringing on a copyrighted work. So, what will constitute a transformation? First to consider is the technology as it exists today. There is a handheld scanner, about the size of the first cell phone to hit the market, attached by USB cord to a laptop. On the laptop is the corresponding software program, which displays what is being scanned by showing an image of what lies in view of the camera on the handheld scanner and highlighting in green what it is able to capture. Once you have scanned an object, this software allows you to erase outlying portions of the scan, smooth edges, brighten the colors, and water-tight the object so that the printing software will understand it as 3D printable. Since this is the extent of the editing capabilities in the program, it is advisable to use others to see the full 360-degree scan and make further changes. 

### III. Personal Experience

Without the additional software, the ability to transform a scan beyond the original is quite limited. However, I am referring to the original scan, not the original object. As I quickly found out, it is not easy to scan an object in this manner and create an exact replica. In fact, the majority of the scans I created during the first couple of months were unrecognizable. This raised more questions: was the scanner a tool akin to the camera as I had originally thought? Initially, the more I struggled, the less I felt that was true.
My goal became to create a 3D print that was an exact copy of an object in order to master the technique. Through trials and tribulations, I found three aspects of utmost importance: the object, the environment, and the technique. I began with finding the right qualities of an object. First, the size of the object, and moreover, the scale of the object to the size setting on the software (small, medium, or large) is of utmost importance. Second, the material of the object made a difference in the quality of a scan. Nothing shiny produced a good result, and glass was either invisible on the scan or evident only by flecks of light. Next, the environment must be properly composed. The key to this aspect is light. There must be the right amount of soft light, otherwise the scanner either won’t perceive darker colors or light will reflect off the object and manifest in the scans as blank areas. Finally, I worked on technique. Originally I held the scanner and walked, ever so carefully around the object. However, the background scenery then changed, disrupting the image, and coupled with the slight unsteadiness of my hand was not successful. It worked best to place the object on a rotating surface and the scanner on a hard surface a couple of feet away. Then I carefully rotated the object with the scanner unmoving. The combination of these efforts produced results that finally looked like the object I was scanning.

After reaching my goal, I was convinced that the scanner was a tool – a handheld device used to carry out a particular function. However, I had to put considerable work into finding what to scan and how to do so, not only once to master the technique, but each time I wanted to create a replica scan of an object. With that amount of effort, I wanted to think of the print the scan would create as my own. Nevertheless, I had scanned an object that was another’s original work. This raises the question, at what point is the scan my own? The scanner creates digital data, which the software programs interpret as 3D objects yet display on a 2D computer screen or tablet. This opens up a slew of questions that would be better discussed in an article focusing
solely on that. For the purposes of this article, a more appropriate question is what would I have to do to transform the scan so that the 3D print would fall within the scope of Fair Use?

These scans, regardless of the quality, would produce prints that were still not exactly the same as the original object. The printed versions would clearly be a copy of the original, a derivative. The Copyright Act gives the owner of a copyright the exclusive right to prepare derivative works of their original authorship. Accordingly, a 3D print of the scan I worked to create may infringe upon the rights of the copyright owner of the original object. So where is the balance?

IV. Fair Use vs. Exclusive Rights to Derivative Works

The courts recently addressed this issue pertaining to two-dimensional works. In 2013, the 2nd circuit overturned a ruling by a district court in Cariou v. Prince. In a case about one artist’s use of an original work by another artist, the court found that 25 of the 30 secondary pieces accused of copyright infringement in fact made Fair Use of the originals because they were sufficiently transformative. In contrast, the 7th circuit disagreed. In a case decided in September 2014, Kienitz v. Sconnie Nation, LLC, that court specifically rejected the 2nd circuit decision. The opinion highlighted the fact that “transformation” was merely an element of the four factors that the Copyright Act has vested in deciding what constitutes Fair Use. Essentially, this court claimed that under the 2nd circuit decision, should a court deem a work sufficiently transformative, that element has the potential to eclipse the true balancing test. In reality, the transformative element should be considered only as part of the first factor, the purpose and character of the use. When the Supreme Court originally clarified the element of the first factor in the Fair Use test as “transformative use”, the idea was that the secondary work should add
something new to the original, with a different purpose or character, which alters the original by adding a new expression, meaning, or message.\textsuperscript{14}

Consider Rene Magritte’s work once more. I used the 3D scanner and printer to attempt to create an exact replica of a copyrighted object, but in the spirit of the artist’s work, what if the scan was adjusted so that the print of a pipe was not functional? The purpose of the 3D print would be significantly altered, as it would only be identical to the original aesthetically. Pushing further, what if the print was still functional, but its intended purpose was in fact as artwork in a gallery? In either case, would that transformation be enough, and would the object’s intended use matter?

V. Conclusion

At this point, the Supreme Court has not addressed the issue, so there is not yet a decisively clear ruling. However, it provides an interesting platform on which to consider 3D scans and the technology. Under the 7\textsuperscript{th} circuit ruling, the amount that a scan is transformed would matter slightly less, as it would only constitute one element of one of four factors. Under the 2\textsuperscript{nd} circuit, however, the amount that it was transformed would weigh substantially on the finding of Fair Use. If working with scan that is a good replica of the original, the editing software would be have to be relied on heavily to transform the scan into an object distinctly different from the original to constitute Fair Use. However, what does that mean for my original scans, those that bore merely a slight resemblance to the original objects? Would those be considered a derivative use, even if some parts were recognizable and the intent was to copy the original?

In Carious v. Prince, the court said what was critical was how a reasonable person would view the pieces in question, “not simply what an artist might say about a particular piece or body
of work.” 15 After the experience of working with this new technology, it is evident that the artist’s opinion should be taken into consideration. What appears to be a simple process or minimal alternation may in fact be more substantial in process and technique. What the reasonable person may not view as transformative enough to constitute Fair Use may miss a nuance of relevance enough to tip the scale. Artists have the gift of seeing those nuances, and should continue to be consulted in the ongoing attempts to answer these questions. After a few experiences with the scanner, I began to take the view that potentially scanning a printable object modified it to an extent worthy of constituting Fair Use. As I became more comfortable using the scanner and software, my opinion began to evolve – it seemed easier. Soon the 3D scanning and printing technology will evolve, becoming better, faster, and more affordable, thereby forcing copyright law to evolve with it.

1 17 U.S.C. § 102
2 17 U.S.C. § 102 specifies these categories: includes “(1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic, and sculptural works; (6) motion pictures and other audiovisual works; (7) sound recordings; and (8) architectural works.
3 17 U.S.C. § 107
4 Id.
5 Id.
8 I used Meshmixer and Meshlab.
9 At the time of this writing, the technology is in the early stages, equitable to the first camera. Like its predecessor, this technology will likely get smaller, cheaper, and more efficient as time progresses, however, it is difficult to set a reliable trajectory for the technology at this time.
10 For example, is the scan itself copyrightable subject matter? What about the image of the scan?
11 17 U.S.C. § 106(2)
13 Kienitz v. Sconnie Nation LLC, 766 F.3d 756, 758 (7th Cir. 2014).