3D Printing: Uses in Arts

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Abstract

With the development of 3D printing as an industry, there are questions regarding its effects on the status quo. In particular, I am interested in the impact of 3D printing technology on art. Art involves different and unique approaches, and I was curious as to how 3D printing technologies, especially as they become more commercially available, will spur innovation and development within the field of art. Thus, this project delves deeper into how art is progressing with 3D printing technology. Through 3D printing, artists have access to create art through new methods. Several different programs are available for artists to construct detailed 3D models. But, the basis for many of these personal use works of art derives from some existing work, so it would be remiss to not discuss the copyright concerns that have been posed. Still, there are many benefits to be gained in the study of art. Art can be perceived as controversial and reflective of how things are, and with the introduction of 3D printing technology, we will see how art will change as society is changing.

Background: 3D Printing Today

3D printing will have effects in all sorts of areas in society. Already, the technology is being used in medical studies and for more advanced and careful surgeries. It is being used in extractive processes to assess the rock structures and find the most effective and least destructive way to drill into the ground[1]. You can 3D print food[2], sync music with the printing process[3], and make your own sports equipment like skis[4]. 3D printers are now able to 3D print with materials that are able to conduct electricity and can contribute to the further advancement of other technology[5].

Amidst the stir being caused by 3D printing, the developments will only continue as it becomes more widely available to consumers. From larger and more cumbersome printers, desktop sized printers for personal use are gaining headway. Innovations often spur from individuals playing around with technology and happening upon a game-changer in the industry. With the scope of this technology, these innovations could occur in a number of influential industries, from automobiles to weaponry to pharmaceuticals. 3D printing has the capacity to affect considerable change in our society.

Figure 1 – 3D printed model of Nintendo's Pikachu, made by Agustin Flowalistick

But even aside from these more profound uses of 3D printing, its use in the world of art will have, and has had, similar significance. Especially in personal use, it is important to note that 3D printing could have serious copyright infringement claims as people make replicas of current works of art, such as models of Nintendo's *Pokémon* shown in Figure 1[6]. Still, 3D printing technology offers new ways for artists to explore their art, but also a way for anyone to reimagine existing art.

Current Uses in Art

From the perspective of the art community, 3D printing has already had an impact. With the versatility of the technology, artists can use different materials in their works, such as metal, glass, and ceramics. Additionally, different software can be used to create more detailed 3D models; for example, a Dutch artist used Photoshop to create an outline of a video game character by tracing photos from online, using a sculpting program known as Zbrush to flesh out the model, and then finishing it in Photoshop. The model was printed in plastic but filled later with plaster to make it more solid [7].

Another example is an artist named Cosmo Wenman, who creates models of famous works of architecture. Using either a regular camera to take photographs of the figure or a 3D scanner to capture it, Wenman uses photogrammetry software to create a 3D model of these works of art[8]. All of his models are available on Thingiverse for personal use and are free. Some questions of ownership have come up with these 3D reconstructions, but the cases have set a precedent that these works are ultimately in the public domain[9].

With artists such as these creating incredibly detailed replicas, it is not unlikely that this hobby could grow and create conflict in the realm of copyright infringement. Already, there have been lawsuits over 3D printing models of a rocket from the comic *TinTin*, which Moulinsart demanded be removed from Thingiverse[10]. But, unlike Moulinsart, some companies are being proactive about 3D printing technology: Hasbro, a multinational toy company, has partnered with Shapeways as a way to license their brands for 3D artists to use[11]. Rather than dealing with copyright issues as they come up, Hasbro was able to take preemptive action and allow for some productive use of its creative content, predicting that its enormous fan base for brands like My Little Pony would create a demand for 3D models

Innovations in Art

In my research into how 3D printing is being used in art and how it is developing, I found several fascinating uses. The Van Gogh museum in Amsterdam, in collaboration with Fujifilm[12], has created a Relievo collection of 3D printed copies of some of Van Gogh's famous paintings[13]. One, shown in Figure 2, is of his *Sunflowers*, printed using the method of reliefography wherein the painting is replicated layer by layer to

imitate in high-quality the color and brushstrokes of Van Gogh's work. With innovations like this, patrons of the museum are allowed to touch the painting and experience a tactile viewing of the works. For art students, this provides invaluable insight into studies of art. Furthermore, it is an excellent way for the museum to generate revenue, given that a Relievos collection piece sells for something between $20,000 and $30,000.

Figure 2 – *A 3D printed replica of Van Gogh's* Sunflowers

Discussion

The artistic potential for 3D printing is not necessarily the first thing that comes to mind when looking at this technology, but it is certainly one that holds as much significance as any other field. As 3D printing becomes more available to consumers, artists are able to access a new technology that can present to them a new medium by which to create art, as Iaon Florea does with his 3D printed abstract paintings[13]. I am interested to see whether 3D printing and modeling software will develop to the point that we can 3D print from a 2D basis, such as comics. Certain implications have arisen over copyright infringement and ownership of works off of which 3D models are based. It will be interesting to see how companies develop strategies and what approach will be the precedent for future concerns. Art, though, is important enough that it should not be limited by such arbitrary laws and the concept of asking permission to create something. If art is a reflection of the state of society, then the advent of 3D printing technology in art will represent the innovation of our society now.

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