

I. The First Scans and Learning the Technique

The first time I used my scanner I wanted to get a feel for how the programs worked, and what I would need to attempt to do while scanning outside. I knew from class that the lighting was going to be an issue – as Janos had warned us – so I made sure to scan in late afternoon/early evening when the lighting would resemble “dusk”. Janos mentioned that it would be important to note what we each chose to scan at this point during the project. Outside of school and work I enjoy art, enough to earn a bachelor’s degree in art history, but without any formal, hands on artistic training I wanted to make sure *I* had thought about what I chose to scan – since everybody else would be analyzing that. With that in mind, I started with things that I love in my apartment.

First up: my cat. He’s a little monster, but he’s my little monster. He doesn’t hold still often, but I wore him out playing fetch and then attempted to scan him. Here’s what happened:



The image to the left is a screen shot of the best scan I could get, even with him holding still. I believe you can tell that the scan is of an animal, perhaps even of a cat. He is sitting on my couch, with his paws out in front of him. His paws and neck are white, and the rest of him is a muddled brown color. You can perhaps also tell that’s little face above,



at least with the context that I believe the ear provides. Although he had moved by the time I was able to take this picture (into a new, lazy position on the couch) there he is above on the right for comparison. First lesson learned: scan things that aren’t going to move.

Next I moved on to an inanimate object I loved: an elephant. I was still attempting to scan things that had sentimental value to me, and I have an incredible extensive collection of elephant figurines. The first one I tried to scan was about five square inches. A beautiful little statue which an artist hand paints and sells, with a large portion of the profits going to foundations which raise money for elephant wildlife conservation. I thought the scanner would pick up the vibrant pinks and yellows, but despite my roughly 9 or 10 attempts, no such luck. It captured pieces of the elephant, a shoulder here, a leg there, but nothing that resembled what I was looking at. Furthermore, the act of “water-tighting” the objects in the Sense software distorted the scan so much further it was non-recognizable. Second lesson I learned at that week’s group meeting: it’s okay that something not precisely resemble the item I am scanning. When I showed the team the 3D scan of the elephant before I “water-tighted” it in the sense program, almost all of them had the same reaction, “Oh! That’s Interesting!”. As artists, they saw something in the

scan I didn't see: they saw something that caught their eyes. One team member pointed out how even though the elephant wasn't a solid object, it was interesting how the pieces made it appear as though there were more than one, or that perhaps that it was conveyed movement, as there appeared to be multiple legs on the scan. Slightly uplifted that I wasn't a total failure, I returned to scanning with renewed hope.

Still attempting to pick objects that had personal meaning, I chose a different elephant from my collection on my second round of tries. This one was even smaller, about 3 square inches, and white and shiny. I had the same experience – I couldn't get a scan that even remotely resembled the little elephant statue. This time was even worse than my first attempts: the Sense software just said "Lost Tracking" every second or so. Sometimes it would blink back and re-find the figurine, but that was rare. I didn't even bother to keep these scans. After talking with Janos and the team about their experiences, I learned my third lesson: size is critical. Shoot for about one to two square feet.

At this point, I figured I should scan something with a more interesting shape. I chose a fake flowering plant that I have had for over ten years (the fake ones don't die when you forget about them for months on end). It was about one by one-and-a-half square feet, brown and maroon in color. Still in my apartment, I chose a different location with brighter lighting. The scanner was better about not losing tracking, but in the end it didn't pick it up the pot portion of the plant, instead just the petals. I realized that it was likely because they had a glaze on them that the plain pot didn't have which caught and reflected the light a little bit better. Here's a screen shot of the scan:

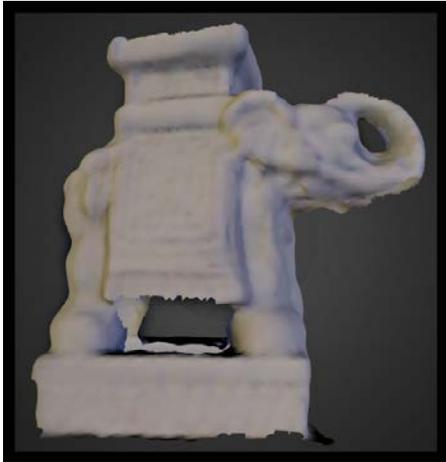


I was excited because, although I couldn't make a 3D print of this (since those need to be air-tight), I *personally* thought it was extremely interesting to look at in 3D. I thought the petals had interesting shapes and I loved the way I could move them around in a way that I never could with them attached to the plant (without a large pot getting in the way of the view). I thought they looked a little bit like butterflies, and was trying to think of an artistic way to connect them to nature. I wished I was better with the

software programs we had available to us, because I imagined being able to move the different flowers separately and create a new arrangement, even perhaps one that could be solidified and printed in 3D. I was beginning to think of copyright issues, and although I couldn't find anything that lead to believe that the plant or the leaves were copyrighted, I imagined using parts of something that was to create something new in this manner and how much of a transformation would have to be made to make something new and different enough to not infringe on an existing copyrighted piece.

Unfortunately nobody in my group saw what I saw, perhaps because of the sentimental attachment I have with the plant I saw what I wanted to see. However, this was the first real connection I felt with the scanner and software. I hadn't intended to scan only the flowers, but I was pleased with the way it turned out. That made me think: how much is the scanner a tool? It wasn't my artistic decision to scan only the leaves, but somehow between the scanner and the software, that's what it picked up. On the other hand, I did have to use the software to erase a few specks of branches that caught the right amount of light so that only the petals remained, was that enough to have "changed" the object? Or were my minor contributions immaterial? I continued to ponder these questions as I scanned more objects.

Still quite unsure, I decided to scan an object outside where my neighbors might see me. We were encouraged to scan in public, and to engage passers-by who seemed intrigued by what we were doing. Afraid to venture too far, I started just in front of my apartment. Only one man stopped to watch for a minute as I attempted to scan yet another elephant. He could see my computer and he asked what I was doing. I live in South Boston, or Southie, and he was an older man who seemed like he had lived in the neighborhood for at least a good part of his life. Attempting to refrain from too much upfront judgment, I am guessing he was the type of man who didn't like the gentrification of his neighborhood and was off-put my "antics" as he referred to the whole scene. Looking back, I was nervous about what I was doing, my lack of confidence in my skills to do it "right", and the amount of money the technology I was using cost, so there could have been another explanation for my hesitancy to talk more with him. It was later brought to my attention that many people, and older people sometimes more than the younger generations, don't like technology and the changes that new technology can bring. There may have been an element of that as well. Nonetheless, he did stay and watch, and gruffly asked what I was doing. I explained that it was a 3D scanner, and that the program captured a 3D image that you could then play with in different software programs. He asked why I was outside doing this, so I explained that the lighting was better outside at dusk according to my instructor, to which he asked was I a student, and where did I go to school, etc. I managed to explain how I had become involved in this project and told him about how Janos had come to class and taken a 3D scan of a person. He looked *shocked* at that statement. What I thought was so cool – you can scan a person and it looks just like them! – he did not appear to appreciate. After mumbling something along the lines of, "well that's about enough for today" he went on his way. I could venture a few guesses about why his reaction was so sudden when he had appeared to be warming up to me, but I will likely never know. However, the conversation with him did keep me outside long enough to get a decent replica scan of the appropriate sized object in good lighting:

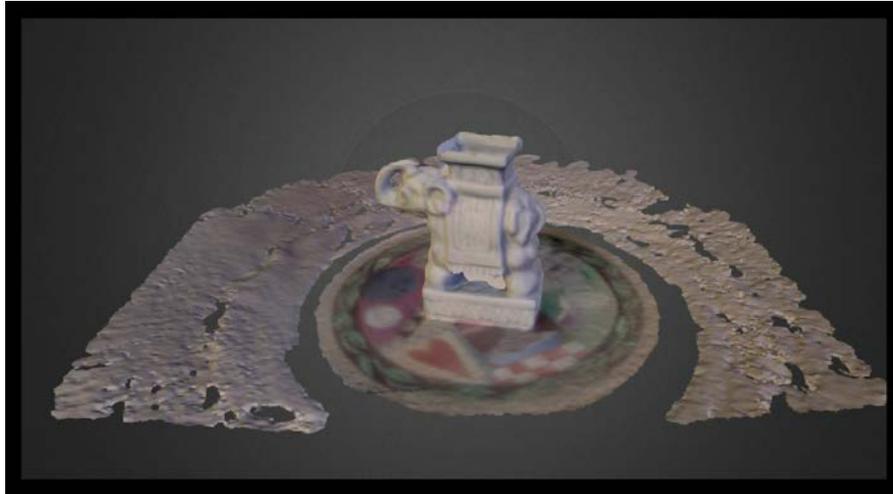


Although it's not "water-tighted" you can make out a lot of the shapes and curves that this statue has. It's originally a soft blue color which comes through slightly, but the color was partially distorted by either the lighting outdoors, the scanner, or the software.

This scan gave me great hope! After talking with the team, I was encouraged to use what they referred to as a "lazy susan". I always thought that was a cabinet in the corner of your kitchen that turns in a circle to make use of all of the corner space (and hold cans of beans and such) but apparently it's anything that turns like that. I was excited by this because, one, I own something exactly like that, and two, it even has extremely sentimental meaning to me. The first thing I wanted to do was scan the surface of it. It is a 3D object of course, but capturing it's depth was too difficult for me, even after many attempts. However, those attempts did yield fantastic results in capturing the images on what would become my best friend in this experiment. This was a gift given to my husband and I for our wedding from my aunts and uncles. It was designed by them, especially for the two of us and encompasses our lives together incredibly well as everything on it has personal meaning. Artisans then carved the designs into the wood and painted it. This of course was an even more exciting aspect since I was beginning to think about copyright infringement. This is a one-of-a-kind piece of artwork, and although many different people contributed, it was made by a company who specializes in this type of personalized craft. Was I infringing on a copyright? After all, copyright is created in a work once it is fixed into a tangible medium of expression. Luckily, the it would have to be registered for me to get sued and I won't make any money from a scan of it that may only be kept private, so I pursued. To the right is a scan of the top of the lazy susan:



After I successfully captured the image, it was time to put it to work. The first thing I scanned was the elephant with which I had previous success. Without cropping out the lazy susan, or the surrounding ottoman that propped up the elephant, this is the scan created after working with the environmental variables:



I love that you can see the surface underneath the lazy susan surface. This was by far the happiest I had been with the scanner yet. It captured both objects I had minor successes with so far. I felt as though my faith had been restored. Lesson four: you will have more success when the object turns smoothly than you will when you attempt to move the scanner around the object.

It was time to begin playing with the final important environmental factors and bringing them together in harmony: the brightness in the room, light reflection, material of the object, scale of the object, steadiness of the scanner, and settings in the software programs were the most important. I used many objects, tried many different times of day, switched the materials from plush to shiny and everything in between, and found what I thought was the perfect combination of these. At this point, I was still attempting to infringe on copyright objects. I wanted the first-hand experience of attempting to replicate something I thought I shouldn't. Some of the best scans are pictured here:



In the process I produced one of my favorite scans. I wanted to see what affect scanning something in glass would have. I didn't have a smooth glass vase, but I did have a decorative one which I have slowly filled with wine corks. Although the scanner didn't pick up a hint of the glass, it captured the corks beautifully, pictured on the right.



Again, this scan isn't printable because it isn't water-tighted, but I love the texture and the hourglass shape. It lost something when I solidified it. In fact, in my struggles with technology, most things seemed to. I understand that an object must be air-tight to be printed, but I could not grasp how we were supposed to water-tight a 3D scan in the first program, and then change aspects of it in another program. I came to understand that my teammates on this project knew from the beginning that you must water-tight the objects in the first program, Sense, before dropping them into the others, Meshmixer and/or Meshlab. I found the second two programs so much more user-friendly. I could see all aspects of the objects better, and I could erase the extra images that the scanner picked up as I desired. Convinced that this was a solvable problem, I embarked on my second incredibly frustrating aspect of the new technology: making the software do something it is just not capable of doing at this point in time. The best way to delve into this aspect of the course is through the experiments I had working toward my final project.

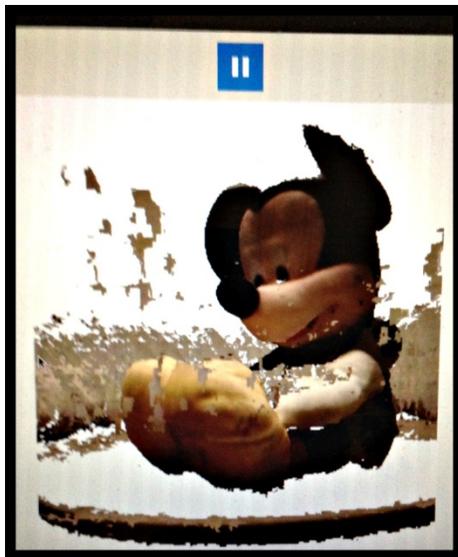
II. The Mickey Diary

During my first experiments, I scanned objects in different environments, with different techniques, and numerous sizes of objects to ascertain what combination allowed me to produce the most realistic 3D scans. I discovered that within the Sense program, objects that I scanned on the "medium" sized setting were the best quality. After choosing that setting, the 3D scanner best captured objects between one and half to two and half square feet.

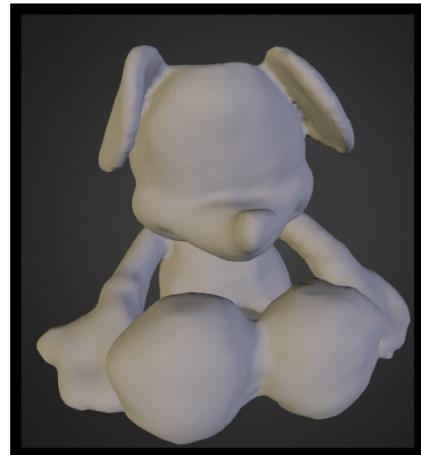
After meeting with one of my Professors, I realized that I had been trying to make exact replicas of artistic objects. For the majority of the project, I had been trying to actually infringe on something that I deemed likely copyrighted, or at the very least, copyrightable. So I decided to attempt to copy what I thought to be the most iconic, well-known, copyrighted figure: Mickey Mouse. I found a plush Mickey Mouse toy, which I chose because it fits those dimensions and also because the tag clearly states that Mickey is copyrighted, and moreover, on the bottom of his left foot is the Disney logo sewn in to the fabric. Because the toy is plush, it cannot stand on its

own, which to me meant that the logo was placed somewhere that it would almost always be seen.

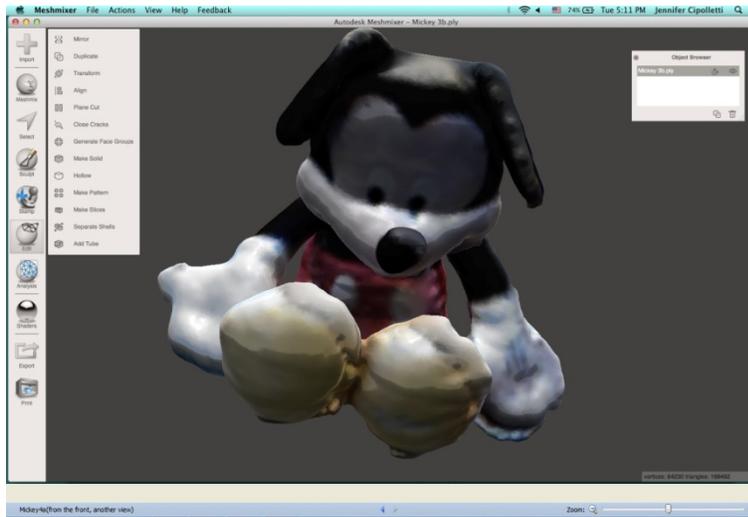
With the first scans of Mickey Mouse, I didn't even try to water-tight them in the first program. I just wanted to see how well the scanner and I could do working together. Once I had figured out a good environment, based on my previous experimentation, I started to work with the software as well. I found a button in Meshmixer that said "solidify" and I thought "genius!". I was convinced I had found the secret to not having to air-tight directly from Sense. I wanted to do this because there was still extra objects and pieces of objects that the scanner picked up while scanning Mickey, like my couch. For example, here is a picture of my screen taken while scanning:



The circular object below Mickey is the lazy susan he is sitting on, and to the right, out of the picture, is my hand turning it. Ever so carefully, I turned the lazy susan around in a complete circle as many times as I could until it lost tracking. I actually love how it makes Mickey look like he's in the midst of some kind of magic (how Disney is that?). Unfortunately, I was sure that the "magic" would ruin the 3D scan and I wanted just Mickey – or as close to a copy as possible. So I didn't air-tight this, and instead dropped it into Meshmixer, where I could delete the extra parts.



After a fair amount of precision work "discarding" what I didn't want, I excitedly went to "solidify" the object. This did not go as planned. No matter how many different settings I played with, solidified Mickey kept turning out like the image to the right. It's pretty clearly a solid version of Mickey Mouse, but I wanted it in color. So I continued to play. With a little luck, I managed to get the image on the following page on my computer screen:



I still think this is a fantastic image. You can even see that the top of head appears to be water-tight! However, when I save this, and then open the version up in Meshlab, it still appears as the version you see above – like a concrete version of Mickey Mouse. [As a side note, the Art Historian in me thought of the statues covering Rome and the surrounding areas which we all think as iconically white, and how they, too, were once covered in

bright colors. After this project in particular, Mickey does seem that classic to me!].

So, as one of my great project-mates said, “the struggle is real”. I think that speaks volumes about where this technology is right now, though, and it’s an important aspect of this project to keep in mind. I enjoyed moments of this experience thinking of how I laugh everytime I see an old photograph with nobody smiling – as I found myself making the same face trying to ever so slowly get an object to scan. I also ventured out into public with the scanner once I was more comfortable with it. I have some scans of some monuments from around Southie in particular that turned out pretty well. Unfortunately, there was a lack of people interested in talking to me about what I was doing. However, it was a good learning experience and one that pushed me in ways I am not used to. It will be interesting to see where this technology goes, but I was lucky to get a glimpse into where it will eventually have come from.

For further scans, see: <https://sketchfab.com/moneyjenny>