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Final Project Report

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**Teammates:** Alex, Liam, Jenna, and Genevieve

Trial and Error

For our final project, our group decided to continue our work from the midterm. The concept of 19th century optical devices was fascinating to all of us, so we went all in on each optical device. Our devices are a 3D printed zoetrope, vector cut phenakistoscopes, and an enhanced Wheatstone mirrored stereoscope. Our project illustrates our effort at engaging with the historical frameworks of early visual media while also using contemporary tools and techniques. I am pleased to say that all three devices worked, with moving pictures and three-dimensional images becoming a reality with our zoetrope, phenakistoscopes, and the stereoscope. As for what I did myself, I created a modified version of a 3D zoetrope model I found online, created a stand for it, suggested the idea of using a ball-bearing for the spinning function, installed the ball-bearing, tested the proper stand measurements, created the horse-running animation sequence, and spray-painted the picture frames for the Wheatstone mirrored stereoscope.

Our group aimed to recreate but also modernize optical devices that predated film, which highlights their relevance in understanding the evolution of visual media. Since I had some previous experience with TinkerCad and I enjoy creating 3D models, I offered to design the zoetrope. I would soon come to find that this was a massive project in and of itself, since I ran into a measurement problem with the base and ball-bearing. Upon the printing of the shell, I was delighted to see that the ball-bearing fit perfectly in the circular hole that was carved out in my 3D model, where the ball-bearing was then secured in this hole with super-glue. Even though the printing of the shell went smoothly, problems arose when the stand for the base was just micrometers off of the proper size. Because of this, I spent the next few days working with Professor Horton to ensure the size of the cylinder that slides into the ball-bearing was the perfect size. This part of the process taught me a great deal about design principles, since, on the first iteration of printing a smaller, modified base, I neglected the fact that including the size of the cylinders was important for documentation and clarity. On the second iteration of printing, where we finally found the proper measurement for the cylinder, the size of the cylinder was illustrated on the base by using holes in TinkerCad. Finally, after much trial and error, the proper measurements were set, and the zoetrope could be fully assembled. I put in my horse animation, and Genevieve inserted the animation that she illustrated, and both worked just as intended. One gripe I have is that our group did not create more animation sequences. Since Alex led the entire phenakistoscope project, I understand how she would not have the time to create an animation sequence. However, Liam and Jenna did not create any animation sequences, which I think would have greatly benefited our overall project. I also understand that Genevieve was working on a separate chemistry project for this class, and I really appreciate the work she did with her animation sequence. Liam and Jenna did help Alex with the phenakistoscope, but, from the info I got from Alex, it seems that both of their roles were a bit lighter and they definitely could have had time to create an animation strip for the zoetrope as well.

For the enhancement of our Wheatstone mirrored stereoscope, Liam bought a pair of glasses with a higher magnification than last time. On top of that, I spray-painted the picture frames black to draw attention away from the background so the picture captures the viewer’s full attention. I believe these two changes truly did improve the overall experience of looking into the Wheatstone mirrored stereoscope. Although the glasses with higher magnification were a bit blurry, the three-dimensionality of the images came through much better. If we were to create another stereoscope, I would really love to figure out a way to get the picture frames to slide inwards and outwards. I think this would allow users to focus the images much better, and some of the pictures of the older Wheatstone mirrored stereoscope appear to have this kind of functionality.

As I mentioned earlier, Alex led the phenakistoscope project, and I think they turned out wonderfully. She told me that Jenna helped her look for animations they could use online, and that Liam was in charge of the handles for the devices. I would have loved to see a stand that we could attach them to instead of just using a pencil, but that option works just as well too. I did not have anything to do with the phenakistoscopes, since all of my efforts went into ensuring that the zoetrope model was perfected. Since it took me much longer than I thought it would, I was not able to make more animation sequences myself, even though I would have loved to.

Overall, I am proud of our group’s accomplishments. The zoetrope, phenakistoscopes, and Wheatstone mirrored stereoscope were effective in showcasing the historical significance and ingenuity of pre-cinematic optical devices. Through trial and error, we were able to combine historical research with modern fabrication techniques to create functional and exciting optical devices. This project exemplifies concepts we explored in class, including object ecology, craft, and open source. Object ecology was evident in how our devices interacted with each other and their historical contexts, being able to bridge the past and present visual technologies. The emphasis on craft and craftsmanship was present in the hands-on process of designing, building, and refining each device, highlighting the importance of iteration and attention to detail. Finally, the use of open-source models (like the zoetrope shell) and software (TinkerCad) for the zoetrope demonstrates the accessibility and collaborative nature of contemporary design tools. Despite some challenges and limitations, the final products showcased the interplay of history, technology, and creativity. This experience not only enriched my knowledge of early optical devices but also honed my design and problem-solving skills.