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FMX 499 – Senior Project
C. George
Senior Project Statement

I have always been fascinated with illustrations and animation. There was something about watching a character waltz across the movie screen that captivated me as a child and still holds today. For my Senior Project, I wanted to create something that reflected the awe that inspired me to pursue an education in animation.

I knew I wanted to create a short dance animation for my graduating project. One source of inspiration came from Walt Disney's 1940 *Fantasia*. I love how the music went with animation. My second source of inspiration came from a 3D Japanese, animation program called MikuMikuDance. While the program was designed to produce dance videos for the Vocaloid characters, many users use it to animate other 3D characters to certain dance moves. Combining these two ideas together, I was eager to try this with my own 3D animation.

I first drew the character used in *Freeze Waltz* at the beginning of August 2016. I wanted to make a mechanical, ball jointed, doll creature that danced in a ballet style. After I settled on a concept of her design, I drew a reference sheet to later model in Maya. I modelled and rigged the character later that month as a refresher to what I learned in the ART217 and ART317 Beginning and Advance 3D animation classes, though it was never fully rigged with IK handles or animated.

When I was modelling the character, I tried to keep a low poly count to keep the edges hard and sharp instead of round and smooth to give it a more robotic look. Since the dancer's feet are like ice skates, I wanted to have her dance similarly to figure ice skaters. I imagined the dancer would have long, slow, and elegant dance movements, so I settled on her dance style to be classical ballet.

There were several challenges I had to overcome while I was producing this animation. The first was the putting in the IK handles. When I first pitched my idea to Prof. George, I asked if I could use the dancer I made the year before for my project. He gave me his permission, but I had to re-rig the entire skeleton to get the IK handles in the arms and legs to work correctly. Both the IK handles in the arms and legs bucked outwardly. I fixed the problems when I read over the notes and handouts I kept from the ART317 Advanced 3D Animation class, as well as an online Maya rigging tutorial I found.

The next challenge was finding a dance reference to use for the animation. Prof. George introduced me to Alexandra Martin, another digital arts student that he worked with in previous classes. We communicated through email about what I needed, and she agreed to improvise a dance to the song that is used in the animation. We filmed in the Black Box the following week and I was ready to start animating the next day.

The last and most challenging aspect of this project was animating. In Prof. Sutherland's ART217 Beginning 3D Animation class, one of the projects involves you using one of his rigged human models to interact with a lightsaber. I remembered the complications from that project and imagined my final project would be similar. However, the rig in Prof. Sutherland's project as much easier to handle than then one I built for the dancer. My rig made it was difficult to pick up the legs in certain poses or rotate the arms. I tried to fix all the mistakes after I finished animating, but I can still see some weird wavering or flipping in certain parts of the film.

There are 7,800 frames in the dance sequence. In order for me to finish animating by Thanksgiving break, I blocked out about 450 frames to do on a daily basis throughout the month of October. The most complicated motions to do were the rotations and the kicks. The other difficulty was the stepping motions. Alex moved both forwards and backwards in the reference

video. It was hard to properly position the dancer model the same way because I worked entire in the side view perspective.

I used a three point light system in the animation. There are two key lights, both placed on both side of the dancer, and one ambient light. The floor is a simple plane with a UV texture map projected to make it look like an ice rink. The background is a sphere shape that also has a UV texture map projected on it. Both UV maps were painted by me in Adobe Photoshop. The snow particles were done separately from the animation to keep the animation's render time at a minimum.

Cinematography and rigging are my weaknesses in the 'Freeze Waltz' animation. For the cinematography, I chose those camera angles based on the MMD videos I watched. The majority have multiple camera angles and transition abruptly with each cut. I considered rendering out the animation like a live action dance video, but I found a single camera wouldn't capture the dancer's movements as well. The only part of rigging that I found difficult was adding in the IK handles. Building the skeleton and binding it to the model was easy. However, the IK handles made the joints buck and bend when it wasn't needed. If I took out the IK handles, moving the dancer would have been smoother but time consuming. With the IK handles, I was able to move an entire joint chain easily, but had to control the chain with more diligence.

My strengths are texturing and animating. The dancer's "skin" looks as I had envisioned for a robotic-like doll figure. The environment, though simple, has a wintry feel to it that goes with the dancer. The animation part is smooth and goes with Alex's dance reference. While there are a few joint problems and wavering, the dancer's movements are graceful and flow with the music. Despite the flaws and struggles, I'm still impressed and proud of what I managed to accomplish for my final project.

Links

Creative Bloq Staff. *How to rig a character for posing in Maya*. 20 Sept. 2013.

www.creativebloq.com/3d-world/maya-tutorial-rig-character-posing-9134476.

'Freeze Waltz' Playblast Preview. 2 Nov. 2017. <https://youtu.be/YBV4cfuxoY0>