

Critical Review

A 3D Computer Animation course is concerned with the art of digital animation in three dimensional space. While the name is rather straightforward, after three years I have come to realize that the mediums of animation and digital filmmaking are an amalgamation of computer science and various art disciplines.

Before I joined, I wanted to tell stories. Plain and simple.

Asking Google a basic question, "What is a story?" brings up the searched, dictionarized and automatically formatted account of definitions of "story", and first comes: "an account of imaginary or real people and events told for entertainment." This definition is a great example of what can be learned from definitions. It tells one what a story is, in very simple words and basic form, while completely underselling the whole idea.

And so follows, an analytical and reflective story or rather a review of my growth as, not only a 3D Animator, but an artist and person.

Narrative

Stories are meant to be shared and told, and the art of telling is exactly what narrative is. It is an art of how stories are served. If, asked in first year, what is a narrative, my response would be swayed towards the narrator, and his telling of the story. Only recently, in my third year, I came to understand the purpose of narration. During one presentation, I was asked a question: "How does that serve the narrative?" after I said I spent a lot of time struggling on modeling a replica of a real world gun. The question unbalanced me and I could not answer it. Thus began my reflection on the narrative, and how I made my stories up until this point. While before I did not give much thought to the narrative, now I realize it is one of, if not the most important part of the storytelling. It governs the mood, the style, the cinematography, the writing, the structure and much more.

In our first year, one assignment was a preproduction of a hypothetical animated TV show. I decided to go with a coming of age story. Even though I went through the themes I would approach in the series, I never gave thought to how to approach them, or their effect any of the elements of the narrative.

In second year, another module provided me with another attempt at directing. This time, after few scrapped ideas, I reformed my idea about a stranded astronaut into a funny sketch. Even though I researched gag comedy and Buster Keaton, translating the theory into practice proved difficult, and I did not understand that narrative can provide an additional setup for the joke, and make the payoff more rewarding, and make the character both a target of empathy and a deserving victim for the audience.

Coming into third year, I was interested in neo-noir. I wrote a dissertation on the topic, and felt confident in making my final project a neo-noir. Reflecting on the preproduction, and production so far, I can see that even though I did take up some characteristics, I completely failed to understand and successfully translate the stylistics of what makes a noir film. Furthermore, I underestimated the amount of overall filmmaking knowledge and years of experience required for making a proper film noir.

The way I looked at film noir, was dissecting it into the elements of it's make up. The biggest mistake was not taking time to understand the elements themselves first, for example, German expressionism and the noir lighting. I took time to look at the examples of the noir lighting, the techniques and properties of light, but what was left unresearched was expressionism and what made german expressionism german, therefore my research was insufficient and it failed to lead me into thorough understanding, which would lead to better execution.

Organic Sculpture

Back in first year, for character creation assignment. I created a base mesh in maya which I planned on sculpting in zbrush. After trip to library to gather reference for anatomy, I started sculpting. I followed the muscles from the book *Anatomy for the Artist* by Sarah Simblet, but I mostly sculpted what I saw, and two characters I created for Production Practice assignment (A viking and a valkyrie) faired a lot better, although I did follow tutorials for most of the anatomy. I discovered that I quite liked creating characters, so I tried to better myself at anatomical sculpture. Early in second year, I did an anatomy study on a torso, then a face sculpture near the end.

I uploaded the anatomy study(right) to the polycount forums for critique. Most of which was directed towards the landmarks, therefore I figured I need start in that place next time.

Later, I neglected my anatomy studies, which showed in early 2018 as I struggled with proportions and bone landmarks, resulting in lower confidence during the process of sculpture and diminished result/time ratio.

Looking back now, my biggest issue is proper form, planes and landmarks that are tightly tied to proportions. Furthermore, a skill I deeply lack, and is not yet supported by previously mentioned issues is pushing the forms for more distinction and appeal.



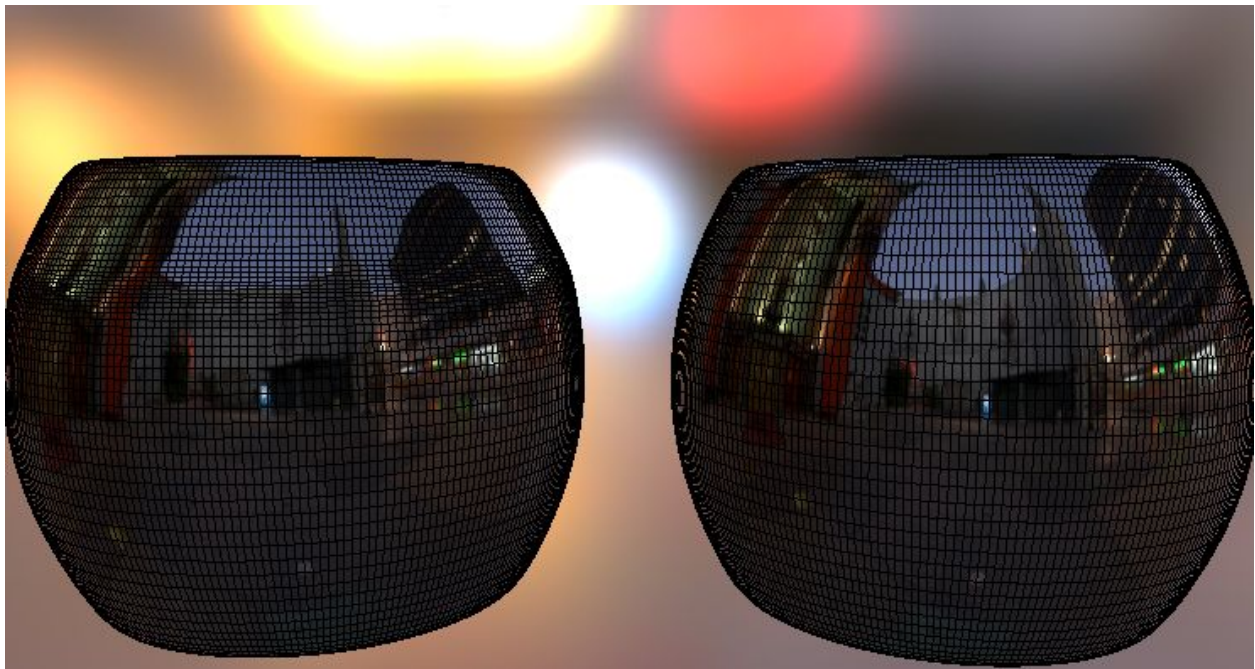
Topology

First year on the course was full of delusion in how 3D models are made up. I was convinced that every single model needs to be exactly composed purely out of quads and has to be a single connected object. Second one was a plan mistake, but the second one is a bit more complicated topic. Even now I hold strong preference towards quads, but over the years I started understanding the underlying reasons as to why.

Even though geometry is stored as triangles, and is rendered as so, quads provide us with more predictable deformation and subdivision, but for something that will not be deformed or subdivided, triangles are a very viable option as well. One thing we I used to neglect, but now I am mindful of is, is how topology can affect the process of baking high resolution maps onto lower resolution objects, which is extremely vital for games which cannot afford the same level of visual fidelity as visual effects work. Commonly used workflows which result in clean topology for final models are base meshes, clean modeling and retopology, while it is not uncommon for all three to mesh together during a creation of models. There are multiple ways of constructing the surface of a model, and there are as many ways of the vertices can be arranged to capture the shape.

Clean topology is extremely important for animated characters, as the deformation and articulation is dependant on the arrangement of the topology. For example, Brian Tindell, an ex-Character Technical Director at Pixar provides insight into the proper body and facial topology on his website and in his book, *The Art of Moving points*..

Besides animated characters, another place where clean, proper topology is required is hard surface modelling. For my final project, I took a venture into a branch of hard surface modelling: Subdivision surface modeling(Sub-D modelling). The goal of Sub-D modelling is having a low, clean objects, which are then subdivided at the render time, thus smoothed out. One of the advantages is that they are easier to animate and lessen the stress on the viewport, while still gaining fidelity in the renders. But are reserved for VFX productions are completely unusable in games at this point. Understanding of the techniques in Sub-D modeling helped me learn how to reroute edge loops in an efficient manner and think about how light travels across a surface of a mesh to prevent undesirable artifacts and distortions.



Examples of specular reflection due to in-equal density of the edge loops. On the left, we can see a distortion in the reflection due to higher density of the edge loops in one area, while on the right, the reflection is clean and distorted only by the shape of the object. (Image taken from a sketchfab model by Johnson Martin)

Rigging and Animation

Rigging is one of the most technical aspects for the 3D animation, and is one I mostly struggled with. In first year, I created two rigs, a low-poly fox and a humanoid one. They were very simple rigs, lacking any form of controls, constraints and handles, and both suffered from abysmal weight painting, which rendered the humanoid one essentially unusable for proper animation. Since then, I avoided rigging or have taken shortcuts with quick rig tool in maya in second year. In third year, I created two character rigs. First one was an experimental test piece, which included a complete control rig, FK/IK switches for the arms, IK legs, reverse foot rig and IK stretchy spine. After feedback from Raphael A. Pimentel (Animation Director at Luma Pictures), I created another rig, which now included a mix of an IK and FK spine for better articulation, more visible controls, additional FK/IK switches for the legs and twists for the forearms. A feature, that I managed to work into current rigs is IK handle orientation (Knee and elbow orientation direction) . One feature I started including in the rigs is the disconnect of the joint hierarchies of the extremities to allow for easier fixing of possible problems, remaking the whole joint chains without changing the base hierarchy, as well as enabling the FK/IK switches to work properly. For example, the arm rig consists of 4 joint chains that contribute towards the articulation. As for articulation and ease of animation, the extra care in consolidating the Joint rotation orientation axes into a single rule enables a lot cleaner graph editor, where every rotation has an assigned function for every control, thus making cleanup and organisation easier for the animator.

On the topic of weight painting, identified as a weakness that at one point prevented me from even animating my character, a workflow was constructed and researched to properly paint weights on an edge loop basis. A huge help was an inclusion of temporary animation, to identify possible errors and artifacts with improper weights ahead of actual animation.

With regards to acting and animation, I would say I did not animate enough so far, and thus animation is my biggest weakness. Although I did spend time researching the art of animation, reading both *Animator's survival kit* and *Acting for Animators* and notes from David Mamet's Book, *On directing film*, my knowledge and skill remains purely in the realm of theory.

Texturing, Shading and Rendering

(On the right, my entry into Substance Painter Challenge)

Before I started university, all of my textures were differently coloured lambert materials. During the first year, I started with projecting textures from the internet onto the meshes in mudbox which also enabled me to generate bump maps from the diffuse. I consider this basic form of texturing, as there were only two maps to create the final look. In the second half I picked up substance painter for my texture painting, but I did not fully understand the physically based rendering workflow, and as a result a lot of my textures rendered out improperly. In second year, I started to understand how to properly bake my own maps, and delved into the Physically Based Rendering (PBR) texturing, started understanding all the different maps in use for both visual effects and games, and how they plug into the shaders and how to properly render them. I slowly began to understand the texel density when creating my textures, and also re-learned how to UV meshes and minimize the distortion/artifacts. Learning how to make own normal, height maps, and baking additional maps for use when creating textures proved increase the quality and look.



Teamwork, Discipline and Self-Management

Over the course of the three years, I have had the honor of working with different people from not only our course. In first year, we had two group projects, and although first one went smoothly, it has not taught me much about teamwork, unlike the second one. Second time, we were paired up with similar course. Both of our courses had different curriculum, therefore some skill set expectations were not met, causing strife. Ego, expectations, undeveloped teamwork skills, and high ambition all resulted in fully developed animosity towards the end of the project, and subsequent failure to deliver a finished product. Failure to adjust to these conditions seeped into a second year, where another instance of group work during production practice occurred. By this time, I started realizing the weight of a leadership in a group, and I even tried distancing myself from the role. Not only does one have to organize and optimize with different people, but you also have to recognize the weaknesses (not only of others, but yours as well) and adjust accordingly. You also have to be a role model, have to have a great control over yourself, as to not show any signs of stress, anger, or any negative emotion, because they trickle down and permeate the group in negative manner. Only now do I think I

understand, and have the experience to grow into a better leader, and be the pillar that is required to support a successful group, as being a leader is not only about leading, but it also supporting.

Another thing I learned from the experience is, that being motivated is not enough. Everyone has motivations of varying strengths that drive them, but the synthesis of motivation, and the successful transformation of motivation into discipline is what creates the drive. A drive that keeps one going forward. Unfortunately, one of my weaknesses that I have noticed, is I am very prone to tilt due to perfectionism (which I do not yet possess the skills to attain, or touch). Tilting is a term that comes originally from poker, meaning an emotional state of mental frustration, where a player takes sub-optimal strategies. In more modern terms, it is widely associated with video games, where repeated unsuccessful attempts lead to frustration. Repeated tilting from failure to meet self-imposed standards results in emotional strain, loss of sense of self-worth and overall aversion towards the task.

As a remedy, I need to learn to give myself a bit more leeway when holding myself up to certain standards, accept failure as a stepping stone and a learning experience, not as a proof of my own inability. Also I need to learn how to translate the motivation into discipline and drive, where I will be able to reach a point of mitigating failures into bumps, instead of roadblocks.

Feedback

Receiving feedback is a very important part of not only being an artist, but being a person. It is the fuel for our growth. If one is to correct his mistakes, he has to be aware of them first. As such, it is one of the reasons you see people who are very good at doing what they do tell you they are not. The only flaw with feedback is its nature. No one likes being wrong and everyone would like to be the best they can be. Therefore, when receiving feedback, one needs to learn how to take it. A lot of people, myself included tend to be very aggressive, as a form of defense when getting certain forms of feedback, which usually is not the best course of action. Of course, there is nothing wrong with being defensive about our work, but sometimes it takes a bit of humility. Taking all that into account, not only does the feedback have to come from a respectable source(for example, not a random citizen in the streets yelling at you that you suck), but it also have to be given properly. Not only did I struggle with the former, but learning how to give someone feedback is equally as important as knowing how to take one, as both fuel into each other. During the activity of giving feedback, one has to remember to approach it in a respectable manner. Given person spent a portion of their time on producing the piece you are reviewing, you do not want to invalidate their time and destroy their confidence.

The best form of feedback I observed so far usually follows some form complimenting them on parts that were well done (taking time to find positive parts), reviewing the parts that need more work, and leaving them with something they can think about. Important thing is what a lot of people want out of the feedback. I have often found, not only in myself, that people expect the feedback to provide them with a recipe on making the piece great, but I think this is the wrong approach. Best feedback does give you pointers and highlights mistakes to be corrected, but it also leaves you with things to think about, re-evaluate. Critical analysis and learning is what makes the piece better, and what shapes us more into the artist. For a long time I did not realize this, but now it is something I look for in the feedback I receive, and in the feedback I give. (Un)fortunately, this is my opinion on this topic so far, but it is subject to change as I learn more, get more feedback, and work more with people, hopefully leading me to being able to get more out of feedback, and give more in form of feedback.

One case study is my second year anatomical study. I posted it to polycount forums and I managed to get a feedback from lead character artist at Square Enix in Montreal. The feedback I received was on accurate, and it was from someone I admired, but it highlighted many mistakes about my sculpture and methods. Looking back now, it was not bad, but back then it made me less confident in my work, and I did not touch zbrush for few months after. Although I do agree there was a bit left to be desired in the feedback. (Below, the feedback)

JacqueChoi interpolator Feb 2017 Offline / Send Message

start with your landmarks.

Your interclavicular fossa is too far out.

Your top 2 abs should rest slightly above the ribcage (so be like half the length), The menubrium (sternum) should indent and lead to a striation, and the Clavicle is more of an 'S' shape.

The Acromion should be much more pronounced 'rectangle' and in the back should lead to the spine of the scapula.

Your Teres Major is supposed to go into the armpit (inserts into the humerus).

There should be 4 Serratus Anterior inter-digitations, with the top one going into the pectoral (The 5th is a striation).

hope this helps!