

Creative Venture Report

Intro

Coming of first term, we were primed to move into production. Joe and Chris started working on their respective characters and I continued to tweak the design and layout of the library, while also finalizing the blockmesh that would later be used for the animatic. After finalizing preproduction to workable degree, we knew that realizing this project would be a gargantuan task that would stretch our skillset past its frontier. Not only was the time extremely constraining, we also weren't comfortable with where we were with the project, and we were already feeling the pressure of falling behind schedule. Our previous gantt chart required refinement, and extension to cover the production as well, and therefore we did that. Although we established the agreed upon gantt chart as more of a rough outline of the plan, and something to anchor us to keep us from losing sight of what we should be doing at any given point. After some discussions, we agreed that we will try to work as fast as possible, try not sacrifice too much quality for quantity, which was a hard one to balance to say at least (and something I, personally, have been struggling with over past years). Furthermore, we decided that for the hand in of the project, we will submit what we have at that point, but that we will continue developing this project for another month, at which point we will try to submit it to The Rookies.

This year, especially on this project, I was very happy that I had the chance to work with Joe and Chris, especially as a team, as it provided me a chance to develop my soft skills. First of all, I've struggled (and still do to some degree) with perfectionism, which my skills could not support, causing tremendous delays in my work, causing me to miss deadlines. This was also one of the issues that were highlighted to me before joining the team, and some I promised I will work on during the project.

Secondly, I needed to learn how to effectively work in a team. Not only in the past I had some issues with establishing good and reliable communication routes, that would not crumble under stress, I also had to learn how to better trust my teammates, while also encouraging them and overall, contributing as much to a good team atmosphere as possible

Pipeline

We decided on using unreal engine 4, which has been a rather new experience to all of us, although me and Joe have very lightly dipped our toes in it beforehand. This has proven to be another big challenge, as things work slightly differently in Unreal Engine 4 (UE4 for short) than they do in Maya, since UE4 is primarily game engine, that focuses on real time rendering, rather

than offline rendering in maya. The idea to use UE4, as proposed, would save us incredible amount of time, as everything ranging from Lighting, Look Development and Rendering would be done in a real time environment. Another argument was, as me and Joe wanted to go work in games in the future, additional experience with game engines would be beneficial going forward and also, that the time we save on the previously listed tasks, would be used to gather more experience. As someone, who's idea this was, I felt it was my responsibility to see it through, and figure out the nooks and crannies required to make the the work transfer from maya to UE4 as smoothly as possible for the other members of our team. Although I enjoyed the job to some degree, it conflicted with some of my other tasks, and in future I'd like to focus on just one job, rather than to try make everything work. I encountered several issues, which I usually managed to resolve or work around, although there are parts which lengthened the process, especially facial rigging, which I will talk about in sections below. One of the discussed parts was cloth simulation, and if we wanted to incorporate it, which would also be solved engine-side, by the built in NvCloth solver authored by Nvidia, which is used for realtime clothing in games. Although this did spawn another topic as to how to model for it.

3D Animatic

Once we moved into pre-production, it was up for me to set up the cameras inside Maya. I used basic Julia model from Zbrush, cut it into few pieces and added few controls, enabling very very basic range of motion, as to have something to prototype timing and camera placement, as the previous 3D rig that we used for 2D animatic was very different from the shape of our main character. Even though UE4 now boasts a function called Live-Link, which links Maya and Unreal for animation, thus enabling you to preview the animation on the model inside the engine. Furthermore, this feature enables you to navigate the camera inside maya, and transfer the navigation of the camera to maya, with very small latency involved. Unfortunately for our use case, I had to figure out how to export a camera animation from maya, and hook it up directly into sequencer inside UE4, therefore enabling us to Animate within maya, and achieve 1:1 transfer of the data to UE4. After few trials and errors, I encountered a youtube video with a script, that did the job splendidly, and only requiring me to go into UE4 and import the camera into the sequencer into the correct place. The sequencer inside UE4 is a rather recent feature, but it is well equipped, and I am sure I will be working with it in future.

While doing the animatic, we had to face several challenges, and few of them were actually translating the 2D animatic into 3D and figure out whether shots actually work or not, and adjust accordingly. The whole starting sequence was readjusted, but unfortunately I did not manage to complete the whole camera setup for the 3D animatic before handing it off to Chris. While setting up the cameras, I had the chance to try out some basic simulation inside houdini, and I successfully managed to export it out into maya, and into UE4, although I am not quite sure yet how to properly shade it.

Rigging

For me personally, rigging was the biggest and most time consuming thing I have done (and continued) doing. While I managed to rig a character before (besides face), learning from that and taking my rig further was a challenge of its own. First of all, I do not consider myself a rigger by any means, nor do I consider myself to be good at it, but being the only one with somewhat working knowledge of rigging from our team made me the sensible choice for this task.

One thing that I learned is just how much the rigger has to work with animator to craft the rig. I feel like opening the channel of communication between me and Chris helped develop a better rig, as every time I finished part of it, I gave the file to Chris for feedback and testing, whether it breaks or not. Chris has provided me with some excellent feedback which resulted in adjustment of features of the rig, behaviour of some parts, and addition of some controls. Furthermore, I had to make sure all the controls are easily selectable, colour coded and clear, for ease of animating.

Rigging for Game engines

Although there are always several solutions to a problem when it comes to rigging, the options dwindle when we apply what we know to game engines. One of the key issues I encountered is root joints and their placement, which has caused major issues over several days when attempting to export Joanna's proxy rig into Unreal, where her torso kept behaving unexpectedly, which was later solved by a different parenting solution within the spine controls and the Curve driving the spine spline IK. (Please refer to the attached gifs.)

Reverse IK Foot Rig

First of all, due to the shape of Joanna's boot, I successfully developed my own version of a Reverse IK Foot Rig. Although I am a big fan of the traditional reverse foot rig, the tip toe banking can be quite troublesome, especially if the character's boot curves upwards, making the control to bank the foot on the tip toe rather unwieldy for animating. To counteract this, I created a space switching for the ball roll, which enables the animator to start the ball roll, which places the tip of the boot on the ground as the ball of the foot rolls forward, thus mimicking the real life behaviour. As much as I am happy with this interaction, it required me to experiment with the amount and placement of the joints in the reverse foot rig, and looking back at it now, it certainly could be readjusted to also enable animator to turn the behaviour on or off. All in all, I feel like

the solution is quite elegant, although I can see it being improved upon and simplified in the future, if I choose to do so.

Additional rotation joints

One feature I wanted to include is additional rotation joints for the limbs, as to create a better deformation during the movement. I started by adding 3 joints to the upper arms and legs to drive the rotation of the local vertices. Unfortunately, I couldn't get it quite working completely in all parts, and after few days of troubleshooting I gave up on the idea of the rotation joints the upper arm and leg, and kept the rotation joints in the lower parts of the limbs, which worked very well.

Rigging Inky

Inky was another challenge to rig.

First of all, I have never properly rigged a creature before, so adjusting the rig to the inky was rather challenging. Several bones had to be removed, while other issue was proper spine placement, which took me around 3 days to figure out, where to place it and whether make it curved or not. Due to Inky's shape, I had to figure out a separation as to where his spine ends, neck begins, and head begins. I certainly hope I did a good job in that regards. Furthermore, we all agreed that he needs a separate control to drive his belly, as to make him a bit fatter when he moves around. Which posed another slight problem as to how to drive the initial position of the joint when he moves around.

As I previously mentioned, I tried to take extreme caution when creating controls for the characters, which was rather hard for inky. Due to his shape, most of the controls ended up being rather close to each other, interesting the body in multiple parts. I opted for box shaped controls for his legs with one off-colour one. Because I believe, for the animator to have convenient and good control over the character during animation from certain camera angles, then the controls should be selectable from multiple viewing angles, preferably all, but that is not always achievable, especially for character such as Inky. Once again, I always asked Chris for feedback, if he was comfortable with selecting them, and telling different controls apart from each other.

Trials and tribulations of weight painting

Even though I feel like I approached weight painting with a working knowledge, I was proven wrong very soon after. First of all, Maya's paint weights tool interface is very unwieldy, and I quickly learned that plenty of people use their own tools for this reason, as the Hierarchy list is very hard to work with as well. Another fact is, that unless one selects colour gradient instead of the black and white one, then it is very very hard to tell between different weights. Furthermore, the displayed weights for various vertices are sometimes inaccurate, and sometimes, the maya straight up lies to you about influences on some vertices. I very quickly learned to utilize Component Editor to view accurate values on some vertices, while also remove any erroneous influences.

Originally, I approached weight painting Inky with Inside out method and by blocking the values first and smoothing them later, although I feel like this was a good way, it did not save me from some troubles entirely, as I still had to deal with a lot of errors in the weights and some influences jumping around.

One last thing I noticed is the Hammer weights tool, although it can be useful from time to time, I suggest not relying on it too much, as it can very easily make things look very rubbery.

Facial Rigging

After Inky has been weight painted, I started properly rigging his face. As we are working with UE4, we opted out for Joint Based facial rig. The solution in this use case is blendshapes which drive a ribbon, that in turn drives the facial joints. I managed to work into it some hair follicles, which counteract the movement of the joints and help the small nurbs spheres (which are controls as well) move with the skin, therefore the Animator can use the Controllers around Inky's face to move it, and then adjust even more with the small nurbs spheres. This is the first time ever I started making a facial rig, and to me at this point in time seems very hard and challenging. Furthermore, I have not managed to complete it at this point in time, but the eyes and tongue seem to be very difficult to get right. I have made quite research, but unfortunately it was not until very later that I discovered that Unreal Engine actually supports blend shapes in form of Morph Targets. Furthermore, I am not quite sure if I will be able to implement a current state of art technique of FACS based rigging system within the timeframe for Joanna. Nonetheless, I keep learning quite a bit about facial rigging, and I predict Joanna's Facial Rig will take a lot less time to fully complete, as I will be going into it way smarter.

Escape Trajectories (and velocities)

Looking back at the project, I wish I had more work done at this point in time. My main focus for this project was supposed to be environment art, as it is the thing I am most passionate about. Unfortunately, I am yet to reach the point where I can start creating the environment.

The rigging is progressing, albeit it's a daily challenge to actually go progress with it and work on it, as it's far from anything I like doing. What is left to do is to finish Inky's facial rig and add a working tongue. As for Joanna, she needs a facial rig as well, and very not sure if I will be adding any tongue controls for her. Joanna also still needs to be properly weight painted, as Chris is animating with a proxy model at this point in time. The final topology of Joanna is still a point of discussion, as we are not quite sure how to best split the meshes for rigging and cloth simulation. If I have the time, I'd very much like to add a properly rigged collar to her, but it might not be viable at this stage anymore.

Environment art

For the environment art, the current plan is to create a list of assets that need to be created, then assign a priority to the list. For example, very high up in the priority at this point is the Wand, The Flying Broom, Main Book she will be interacting with and then the Lectern. The Design of the library incorporates a lot of repeating parts, therefore I will be able to modularize it quite efficiently, as to save time on modeling and texturing. There are few things that I need to figure out, as the Book needs to be rigged as well, and then some parts of the broom and wand need a rig as well. Fortunately, we were able to figure out how to slot objects onto the character inside Unreal, essentially equipping them. Which will be incredibly helpful going forward, especially for the wand.

Regarding texturing, I am very much afraid I will not be able to create my own materials within Substance Designer, as at home I am lacking the processing power, and I have not been able to get the software installed on my uni, although I did contact Allegorithmic (the company behind Substance Suite) regarding permission to use my own student license at the university computers and they did allow it.

After the environment is done, it needs to be properly lit, which I hope to cram into the tight time space we are now working inside. Although I have some knowledge of lighting, achieving great results requires a lot of practice and knowledge, which I am not sure I quite possess at the time, but I hope at least I will hit the ground running.

VFX

The short includes some scenes which require VFX work, which will be quite difficult, but we will see what we can accomplish, as neither of us has a lot of knowledge about creating visual effects inside any package, besides very small knowledge I have about Houdini and Maya particles and nCloth.

Packaging

After all is done, and if it's done, then it is time to actually package everything into the unreal scene. Importing all character and camera animations into the sequencer and rendering it out. Fortunately, the rendering part is estimated to take at most 5 minutes. After which we are ready to add some sound effects and we are done.

Afterword

Although I feel like I did not learn as much as I hoped for during this project, especially regarding environment art workflows and lighting. I feel like I managed to develop my soft skills, especially team work, communication and managing my expectations. Although I feel like I still need to learn how to manage my mental health better, especially in this line of work. Going back there are a lot of things I would change, especially the scope of the project. I feel like if we continued with our previous iteration of the project, the story about the Goblin and the Dwarf, we would be in much better place overall, although I do feel like the story in this animation is stronger than the one in the Dwarf project was. I feel like everyone did great amounts of work in this project, and I think everyone now has much better understanding of their skillset and where they stand in the manner of employability and ability. I am very proud of Chris and his animation, as I feel like it has developed a lot more from the last year, and he seems to compare himself to higher standard than before, and Joe, who has stepped out of his comfort zone, and I am not afraid that the character he created for this short is made entirely from scratch. Especially since it's a stylized female figure, which I feel he has not done before, including proper facial sculpts. There are still a lot of challenges we have to face as a team in the upcoming weeks, and it is only up to us how we will handle them.