

Production Diary – Neo Drive
L5- Creative Practice 3 (M5X01568)
Jordan Lee – P1702727

Introduction

For this semester we have been tasked to work as a class wide team to create and develop a racing game within Unreal Engine 4. Here, I will be documenting both my planning process and my work log. I have been assigned to the “Neo-Tokyo” level, which will require use of my previous year’s skills of rigging, skinning and animating, as well as using new tools I will learn inside the engine throughout the semester.

Production Plan

As a team we distributed tasks amongst the groups to assist us in organising our time and tasks, so we ensured the time we had for each task was adequate. Below I have formed a Gantt chart to visually display what tasks are required of me and how long the semester lasts.

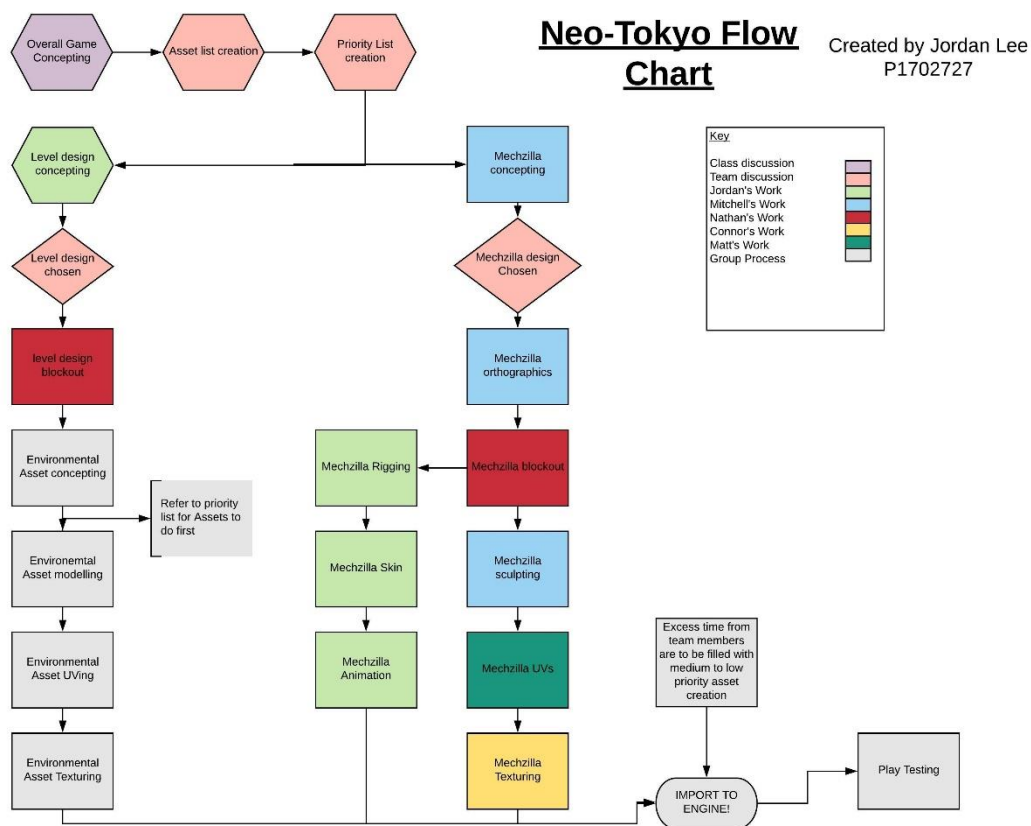
When constructing this Gantt chart, I made a conscious decision to try prioritising the tasks that took the most time last year. E.g. the rigging and skinning process. Due to their only being one model in our level requiring rigging and controllers being implemented for animation, then I planned to have enough time to make the rig to a high quality usable by the animation team.

[illegible]

I have also implemented into my Gantt chart a task priority list. I have ensured that the time allocated for high priority tasks have suitable time for completion. Due to me being the only person rigging and skinning this semester I must ensure that I have enough time to complete these tasks. From last year I have learnt that rigging and skinning can be a meticulous task, so I have accommodated for that.

I have also given myself two weeks as a buffer, as a safety procedure in the event of tasks being late, postponed or cancelled, this is indicated at the end of the Gantt chart when the . If the Gantt chart is successful and everything it achieved within the time frame, I have filled those time slots with modelling filler tasks, as shown in the task flowchart below.

I have also formed a flow chart to help assist and organise the pipeline of how the work should flow to accomplish the final goal of having the tools required for us to make the level we have designed. This flow chart was formed via Lucid Chart.



Neo Tokyo: Asset list

High priority

Medium priority

Low priority

U – Universal Asset shared among all levels

Mechzilla

Rainbow Bridge

Tokyo Tower

Multi story car park

Buildings (max 3) U

Portal U

Emissive barriers U

Signs U

Street lights U

Wire fence U

Chinese lanterns

Chinese architecture

Toll booth

Hollywood sign (Neo Tokyo)

Bins U

Construction cones U

Blossom trees

Scaffolding U

String up lights

Pipes U

Vehicles U

Fuse boxes U

Telephone poles U

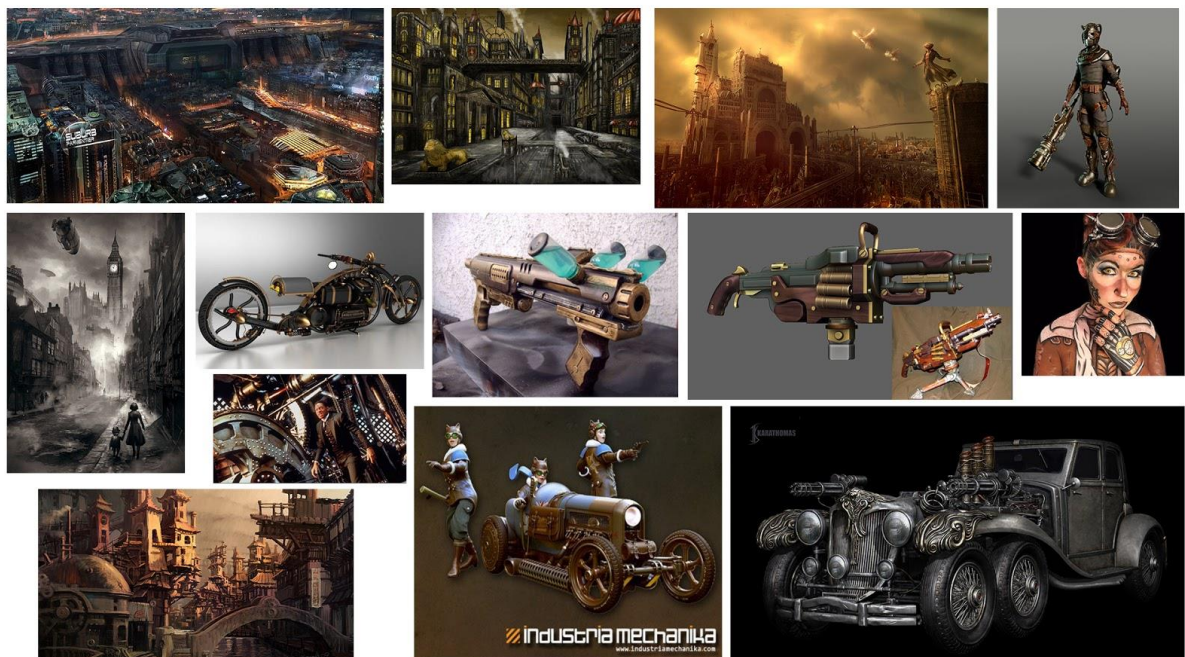
Wind turbine

Tasks

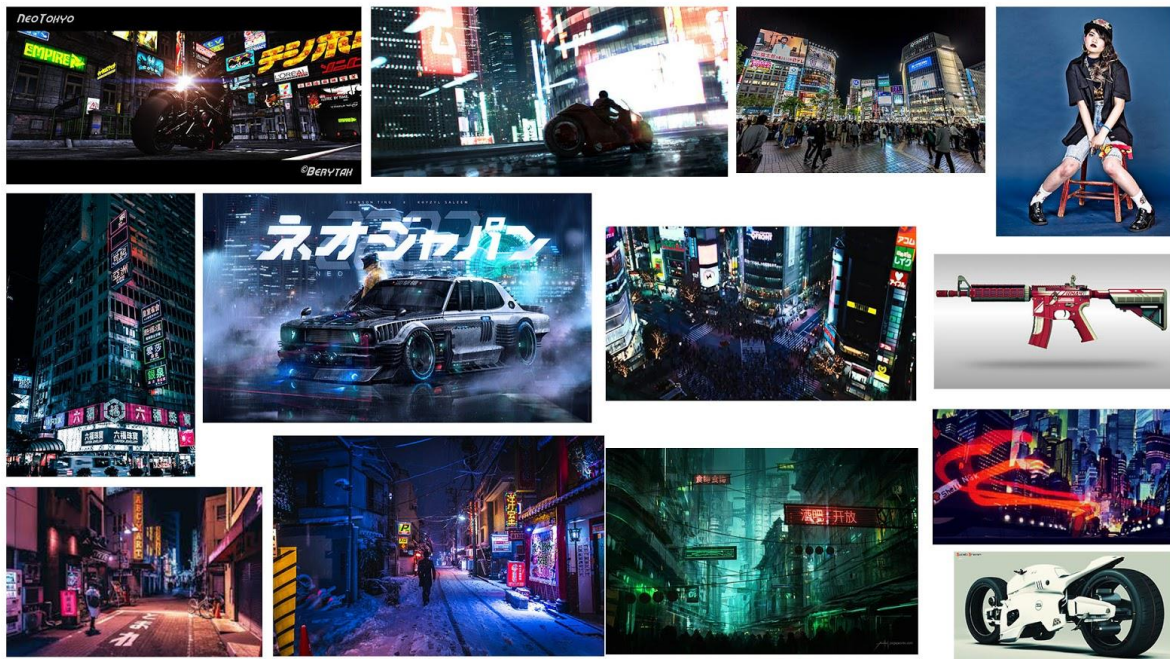
Level Design Concepting 11/10/18 – 16/11/18

In preparation for the design process we were assigned to compose a mood board to gain inspiration when trying to achieve the style. I chose to form a mood board for Steampunk and Neo Tokyo. These styles specifically interested me, and I aim to create a level that brings both elements together. However, if given one theme to work on, I will aim to get the Neo Tokyo theme. This is only due to the strong colours with neon I feel I will enjoy implementing into my level. However, I have taken some inspiration from the steampunk mood board as there is steam, fog or pollution that give the scene a lot more tension. I plan to implement these features into the level next semester when we go into the post processing part of unreal. I plan to use the power of fog to stagger and slowly introduce each point of interest to the player and build suspense.

Steampunk mood board



Neo Tokyo mood board



I have opted to choose the level design for the “Neo-Tokyo” level. As it was the first time, I was tasked to create a level, I wanted to make sure the player knew where he/she was. I will seek for multiple references to obtain the real sense the player is IN Tokyo. I have opted to gather reference from iconic films and locations that have taken place and are situated in Tokyo. These kinds of references will be Tokyo Tower, the Rainbow Bridge and Fast and Furious: Tokyo Drift. (The Fast and the Furious: Tokyo Drift, 2016).



Gathering from these three references, I will aim to capture and set the location of the level to the player, using specific focal points that are iconic to this city.

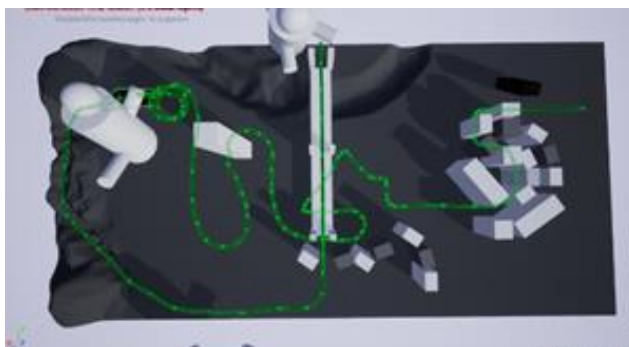
I will use both land marks within my level, and they will be points of interest and high priorities for the completion of the level.

Below is my first draft of the level design, it includes both landmarks and contains a multi-story car park which I gained inspiration from the Fast and Furious film.



From my peers' feedback, I have gathered that the level itself is consistent but appears to be linear in design. Also, the roads are not very organised and structured as you would imagine inside a city.

Also, having handed my level design over to the Unreal Engine team within our class, they constructed my level in a basic blockout form.



Side by side, I can see that the unreal team have followed the design accurately, and after play testing it with a stock vehicle inside the engine. We gathered the average race time to complete the track was around 5:00 – 5:30. This is slightly longer than what we are aiming for. Each level should aim to be around 4 minutes long to maintain the player's interest.

Below is my second iteration of the level design. I have used the feedback given from my peers to alter the length and make some turns occur sooner. I also I have been shown new assets that the engine wants to showcase within the level, this will require level modifications.



Final alterations made to accommodate for the length of the track being too long, we removed a long turn and had the road go under the Tokyo Tower asset.



Found myself carrying out several team discussions helping the team with some decisions such as mechanics, concept/backstory and the direction we wished to take the game.

I also discussed thoroughly with both engine team and level designers for feedback on my level.

I plan to have the addition of the colour theory next semester however the requirement for the semester was to create a block out.

Overall, I found this process to be very dynamic, required numerous alterations and discussions with the engine team. The level design is still subject to change as there have been multiple play sessions where we have taken the feedback and made alterations to the level immediately. We want the player to experience the level and all the focal points throughout the level, making sure that we keep the player stimulated with different encounters and points of interest.

Maya Work 22/11/2018 – 24/11/2018

Due to the delay on the orthographic on our Mechzilla model, I found myself adjusting my time allocation as it pushed my suitable time of 5 weeks to complete the task, into having to complete the rig and skin weights over one night. This was done to allow the animation team to carry out their work significant to their role this semester. This however bottle necked my time and burnt me out significantly when working on my rig. This has the potential to have influence the quality of my rig, however there was implications such as me making the executive decision that I may not be able to make the attack animation. This was not too detrimental because my level is yet to integrate attacks requiring dodging by the racers of the Mechzilla. I project to implement these features next semester when time is more flexible, and tasks are being assigned.

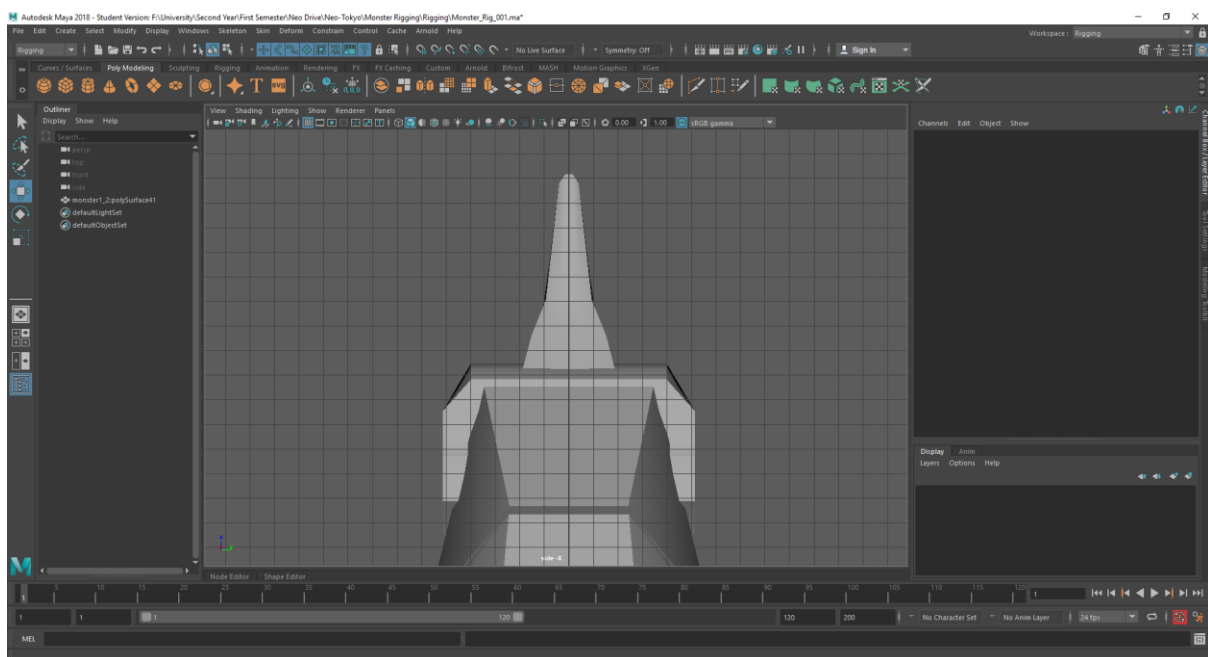
Rigging

Due to the simple size of the model in terms of the world, I had to manually change grid values and render distance to see the model. Without doing these stages will only give me a close view a part of the model, which was not enough to implement a rig.

I applied these settings to all separate viewports, so I can snap the model to grid and assist in joint and pole vector snapping, later in the rigging process.

Pivot point required alteration, as the model was imported to the scene not sitting on the grid. Therefore, I used the snap-to-grid tool to place the model.

Imperative to freeze transformations and delete non-deformer history. While refereeing to my tutorial videos, they stressed the importance of carrying this out, this is to avoid problems in the



later stages when wanting to move controllers and then wishing to reset the positions.

Had to re-align model to centre of y-axis, unsure if this would affect but from previous practices from last year always had this. Ensuring I have continuity throughout my work and to make sure the mirroring process goes smoothly after joints are created on one side.

D-Key was used for moving joints without effecting children joints. This was very useful for moving the neck joint as I needed to move the joint to allow a joint to be along the jaw for movement. This

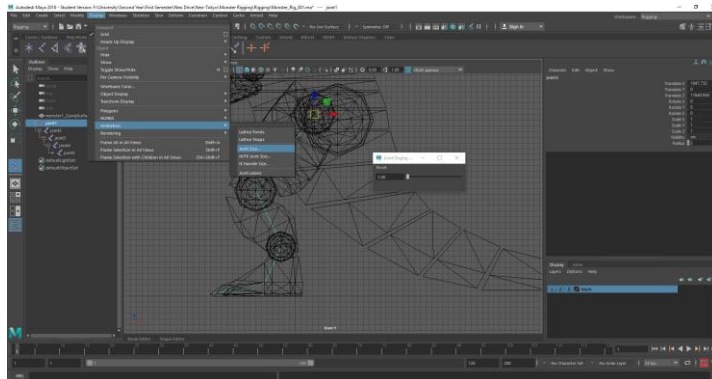
was asked to include by the animation team assigned to do the idle and wanted to have the monster to roar.

I accessed the “Joint Display” settings by navigating through the following drop-down menus:

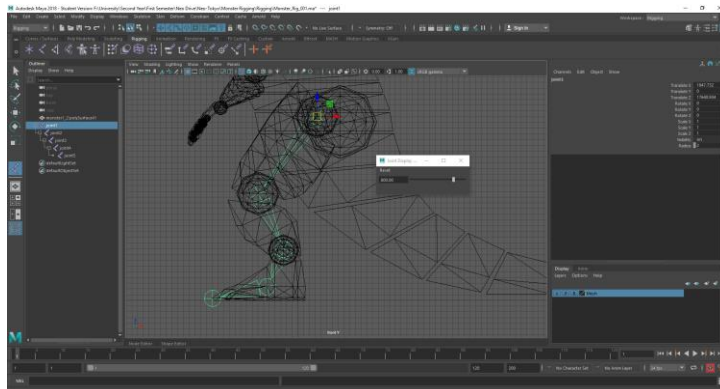
Display > Animation > Joint Size

This was essential as when rigging a model this size it was very difficult to see a default sized joint. Below you can see the difference between both default and scaled joint size. This was a personal preference as it makes it easier select joints instead of having to find them in the outliner.

Default

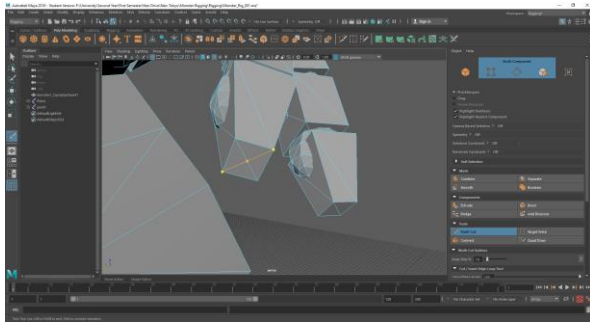


Scaled

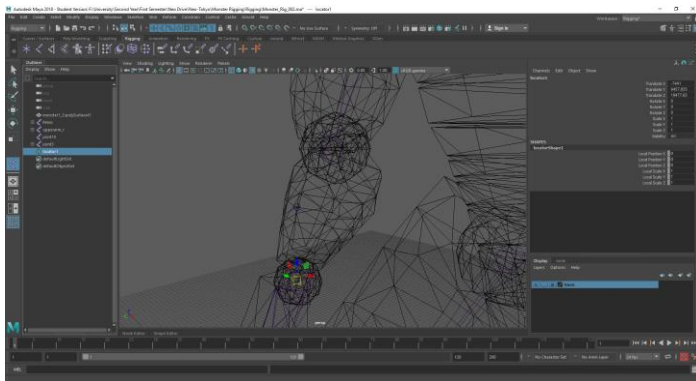


From my previous rigging experience last year, I implemented a trick taught by my lecturers for the forth joints on each finger. This is to have a vertex at the end of the fingertip. This allows accurate placement of the final joint.

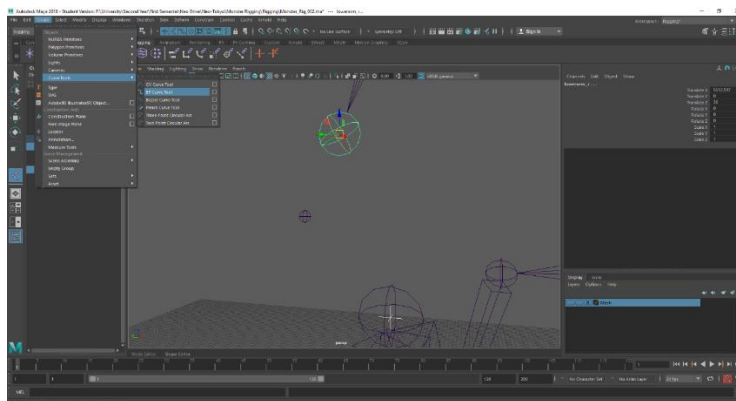
This is obtained by either finding the vertex, and then snapping the joint to the vertex, or if the vertex isn't present, then use the multi-cut tool to form a cut from corner to corner to form a cross. This therefore creates a vertex in the middle of the fingertip to snap your joint to.



Another influence from my previous experience in rigging last year, I implemented an additional joint between the hand and forearm joints. This is to accommodate for the twist that a forearm has in real life. However, this requires accurate placement of the joint in the middle of the two joints. This is done by using multiple tools, locators, the EP curve tool and editing points tool.



Added locator – snapped to middle of joint using hotkey v (snap to vertex)

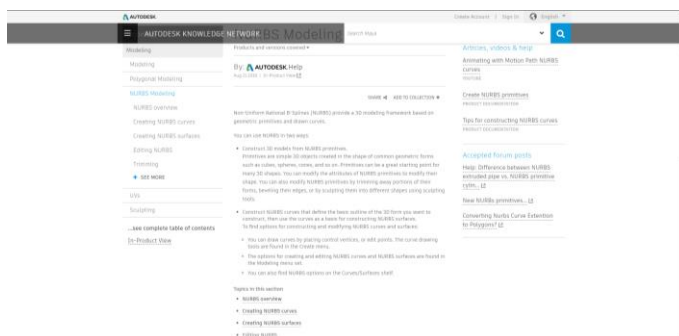


Made locator larger for visibility, achieved by changing the local scale values.

Used NURBS curve tool to find the halfway distance for the “Forearm_twist” part of the arm
Create>Curve Tool>EP

I hid the mesh layer, so I could use the Snap-to-vertex key to place the curve start and finish in the middle of each joint giving me an accurate measurement of half way distance between the two. I then placed a locator to allow easier snapping when aligning a joint to it

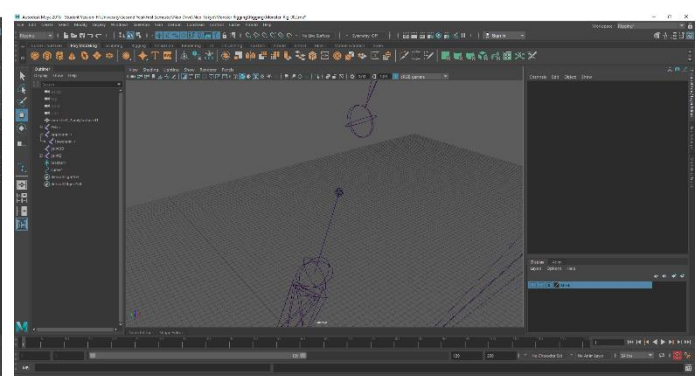
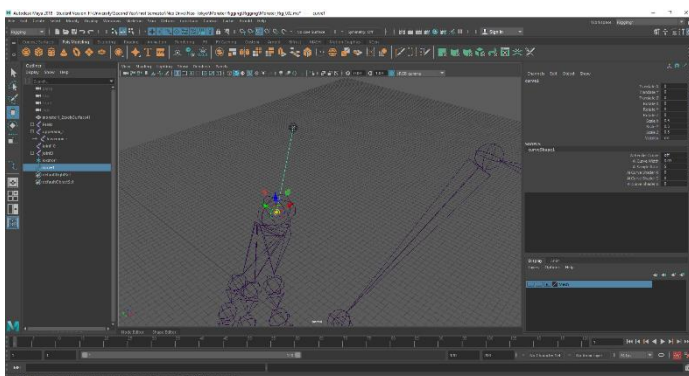
Held Hotkey V to snap the



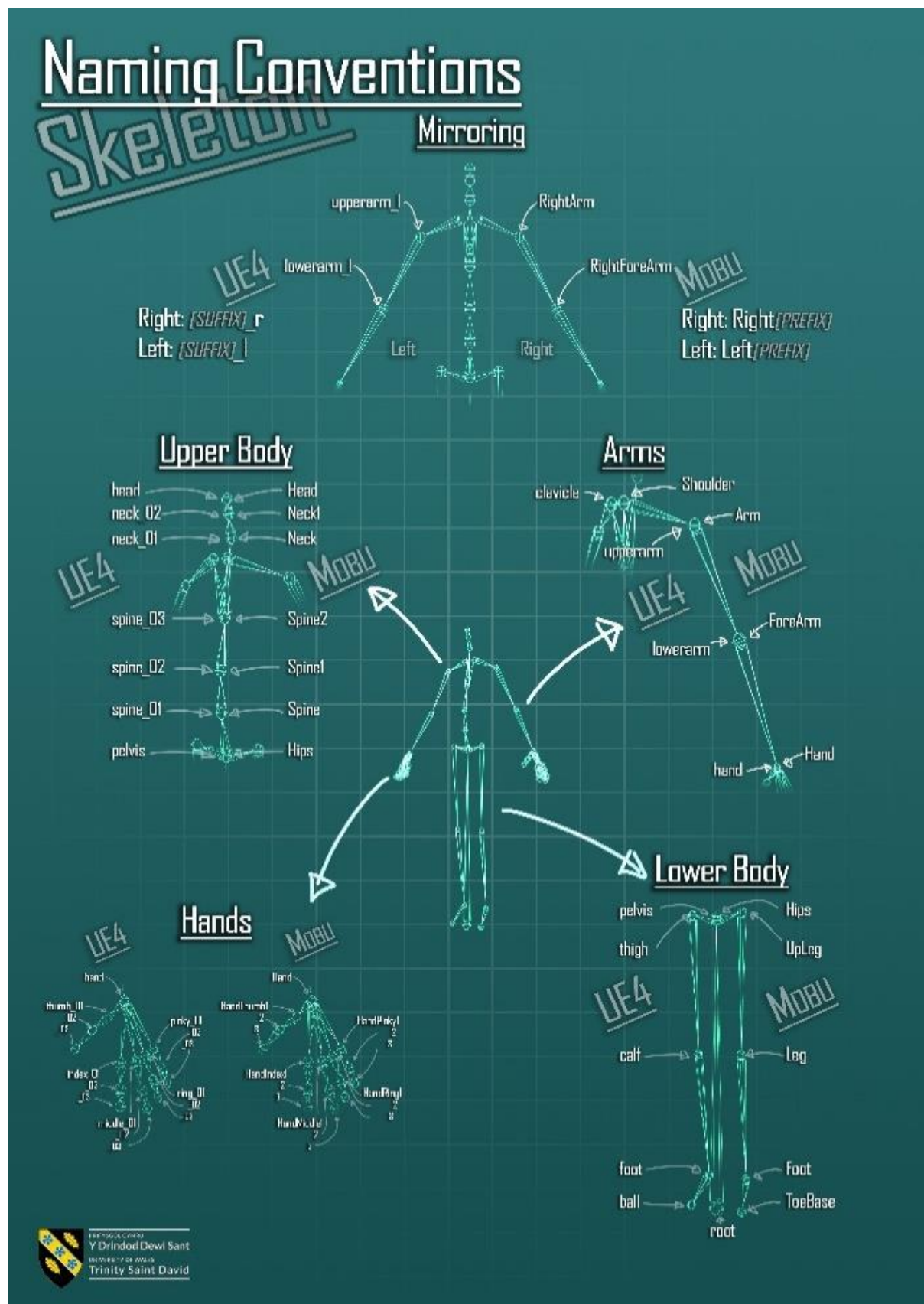
Remembered to move the pivot to the Curve so when scaling it to half (0.5 on all axis) it doesn’t leave the centre of the joint and move my curve.

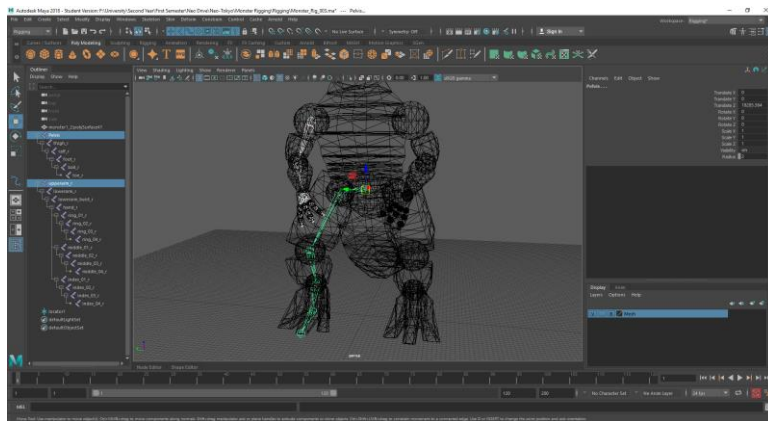
Was unable to snap my locator to the curve, however I deleted the current curve and created a new one with reverse starts and finish and it seemed to fix the problem.

Parented twist to rest of skeleton

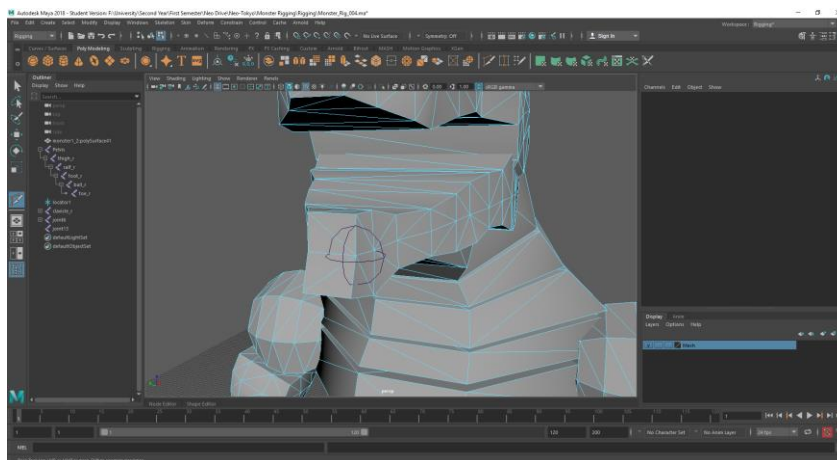


Throughout the process of forming the skeleton, I used the source provided by the lecturers and University last year to abide joint naming conventions.

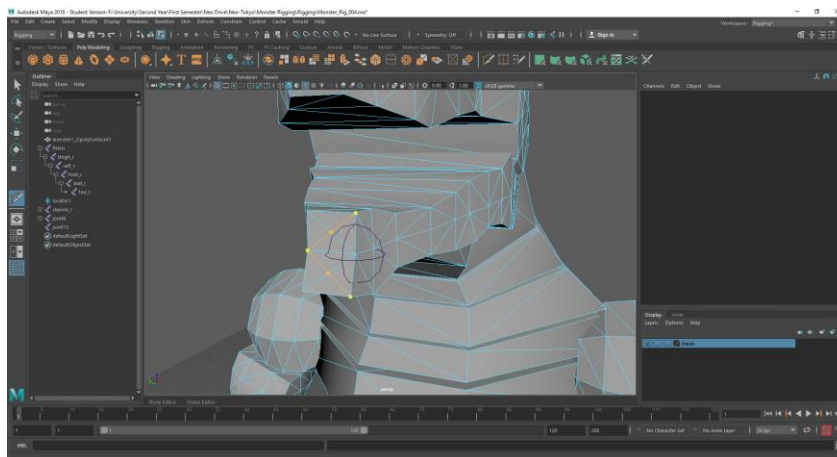


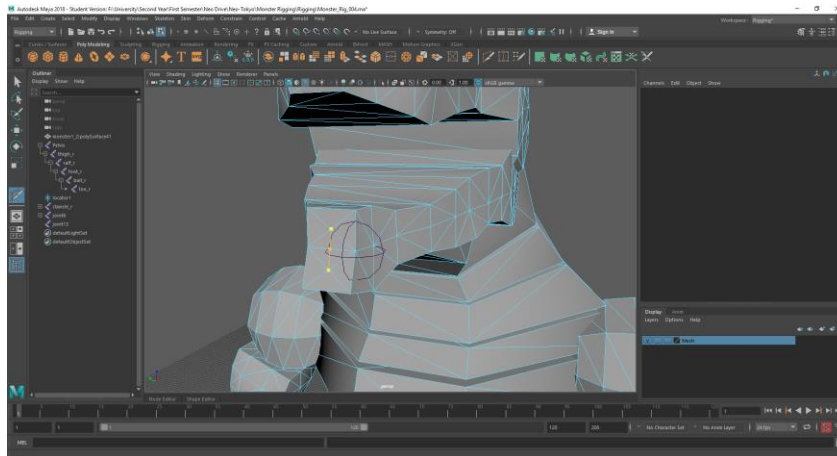


Leg and arm joints formed, named and parented, and ready for mirroring.

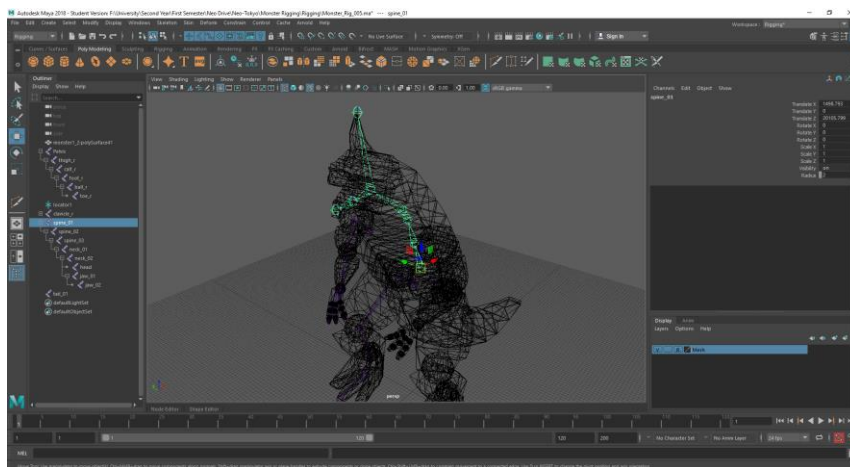


Multi cut tool used for placing the jaw joint on the chin. Wanted to snap the vertex so I used the multi-cut tool to make a vertex.

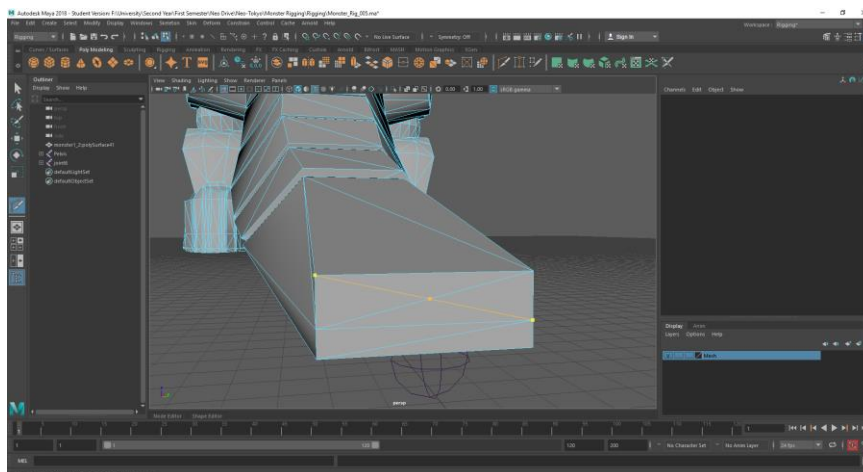


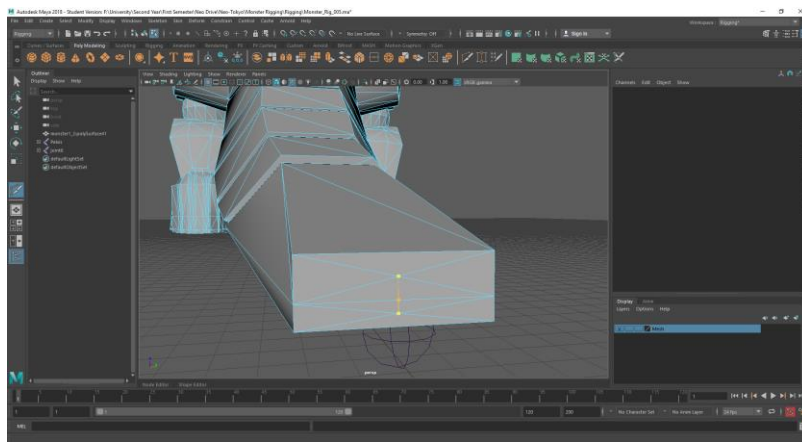
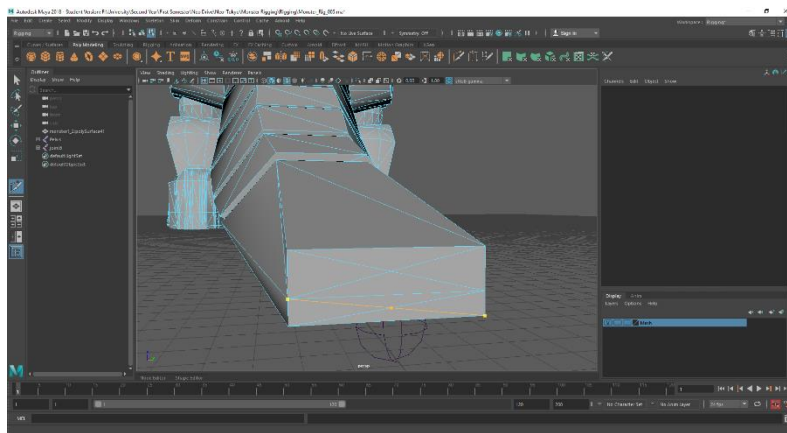


Parented all joints correctly and applied naming conventions

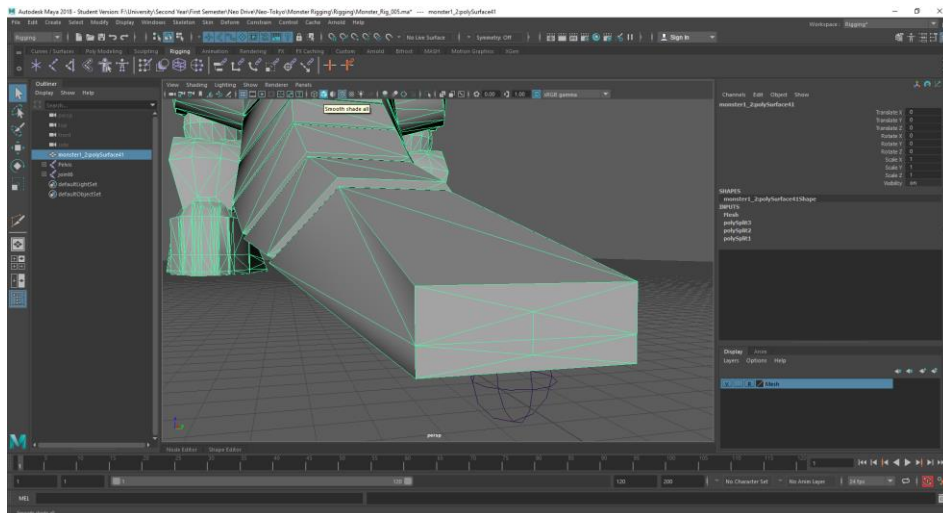


Same process again to the tail, inserted a series of joints along the tail for control, and then using the multi-cut tool to make a vertex to have the terminal joint snapped to.

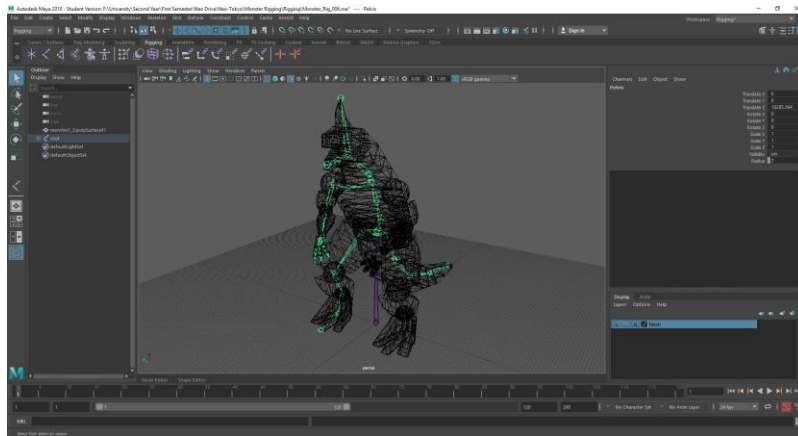




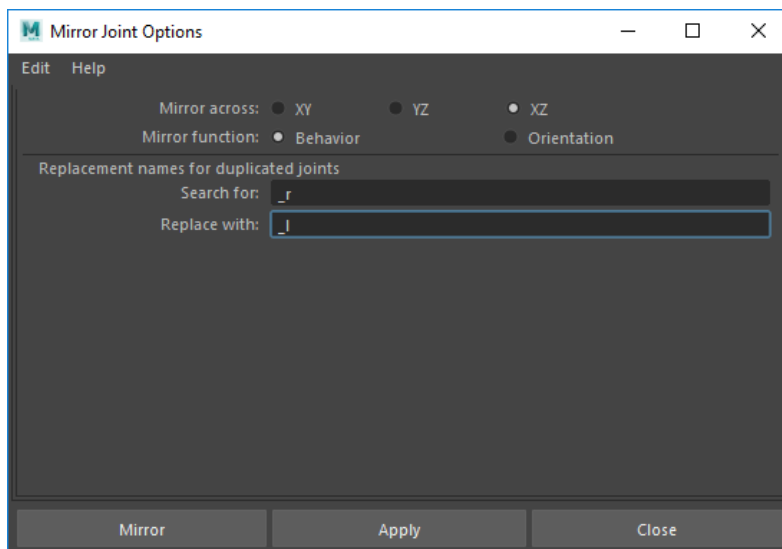
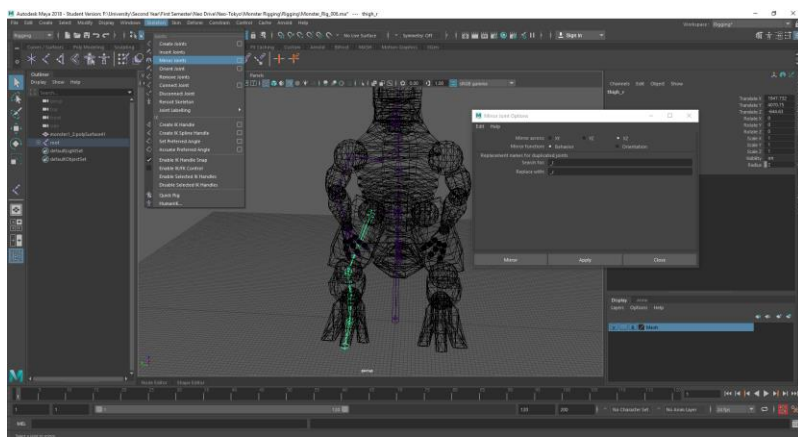
This is some feedback I will need to give to my modeller for future proxy models, to have it not have it triangulated to save me needing to repeat this process several times.



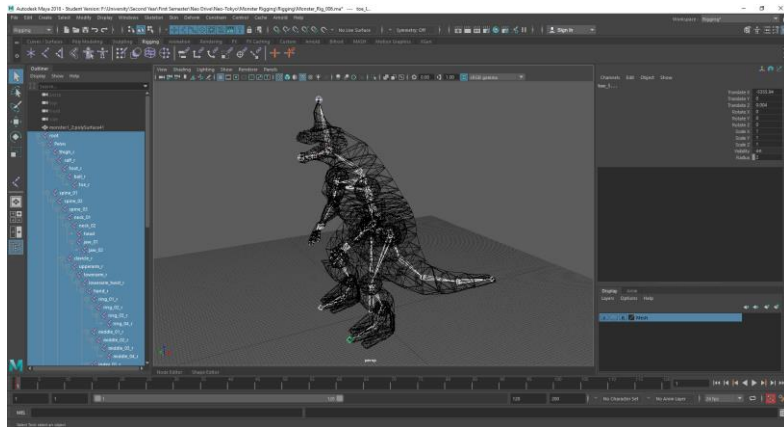
I frequently toggle between both wireframe and smooth shade display via the buttons shown above to ensure I am cutting the correct part of the mesh.



Right side of the rig complete, next task is to mirror the joints for arms and legs across for the left side of the model.

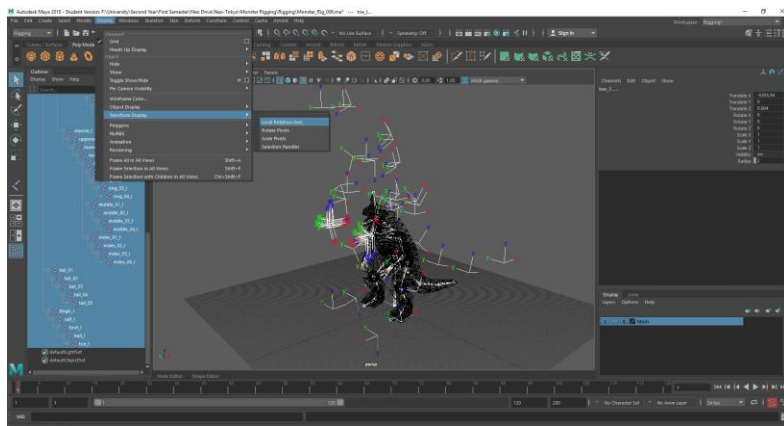


Needed to change the left and right mirroring values around as I began by doing the right side of the model.

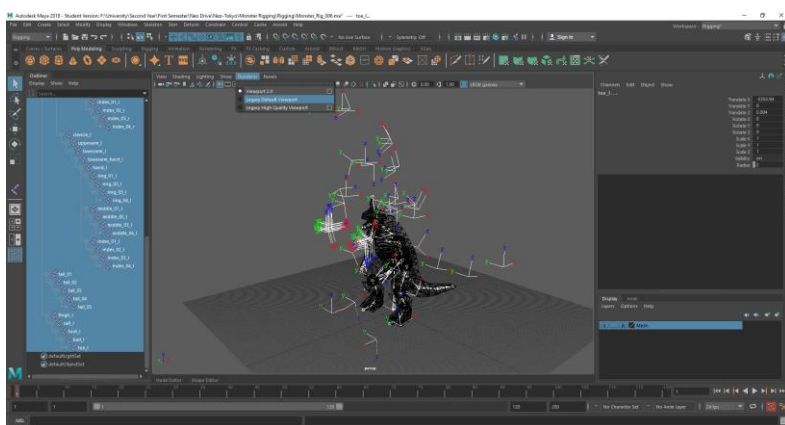


Now joints are connected I will be ensuring the orientation of the joints are correct. First, I am going to display the orientation visibly on my viewport via the following dropdowns

Display>Transform Display>Local Rotation Axis



Once I had it active, it wasn't displaying the information clearly, so I investigated using the legacy viewport under the renderer section. I used this method with my rigging exercise in the previous year.





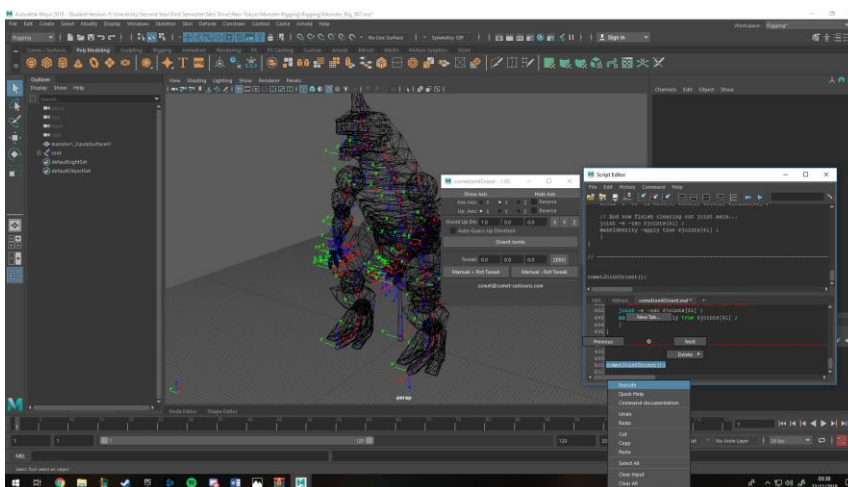
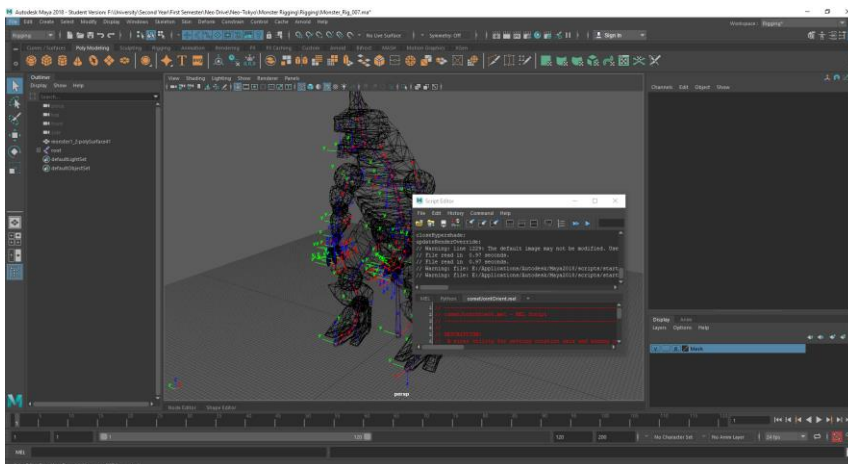
This seemed to fix the issue and displayed the orientation as desired.

Downloaded script

<https://www.animationmethods.com/scripts.html>

<http://www.comet-cartoons.com/melscript.php>

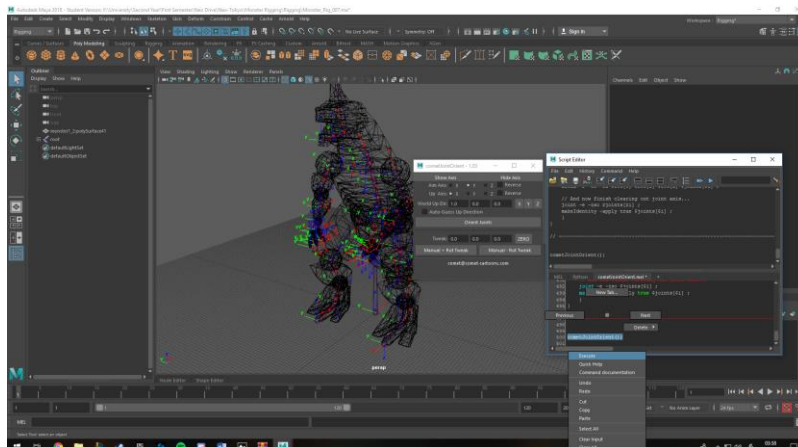
When accessing the websites recommended by the video tutorial from Autodesk, I found myself clicking a link within a link. Leading me to a somewhat unreliable source, however for the progress of the video, I needed it to continue to the next step.



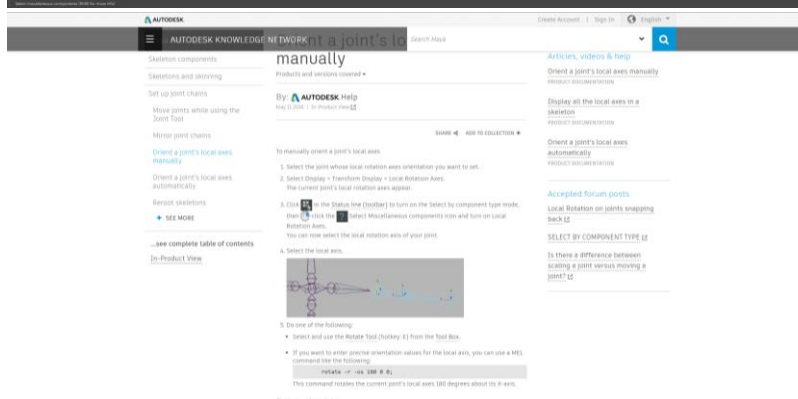
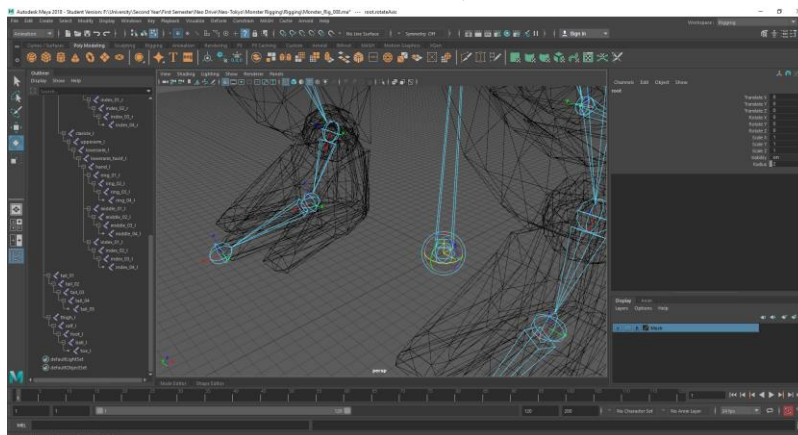
I attempted to use the script to allow the orientation of the joints, however, there was an issue with one of the finger joints from receiving orientation, so I have reverted to doing the orientation manually.

I found using script a lot less time consuming however, there are some issues as seen with unreliable orientation. Also, in the video the example was using Maya 2018 default axis, whereas I am using Unreal Engine 4's axis. This meant that I was unable to just copy what was on the screen and had to make slight changes to the use of the script.

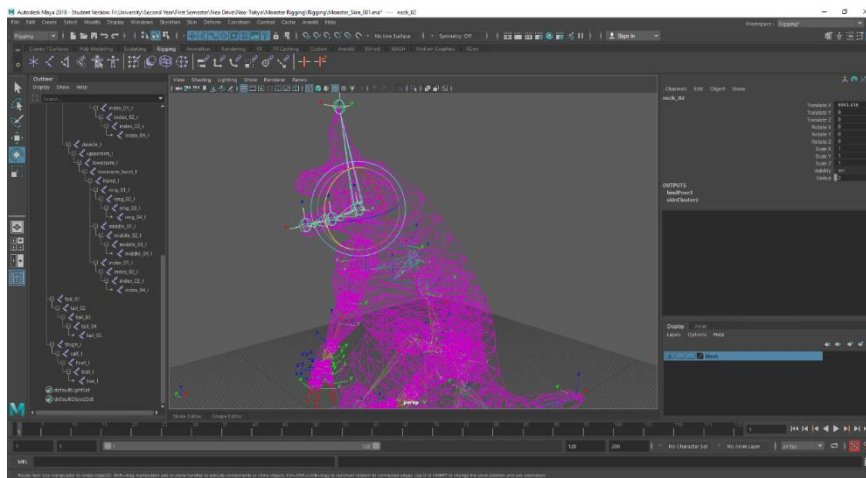
However, this was my first time using the script editor and a new feature I have some experience with now.



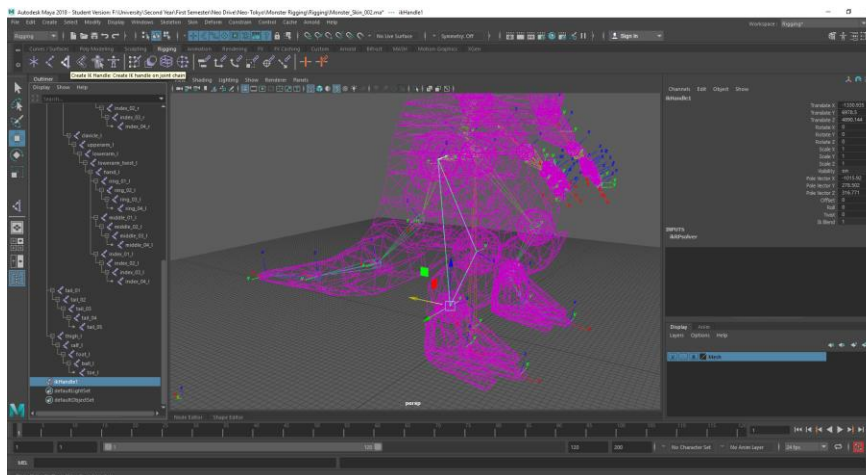
Carried out manual checks on the feet, to ensure correct orientation.



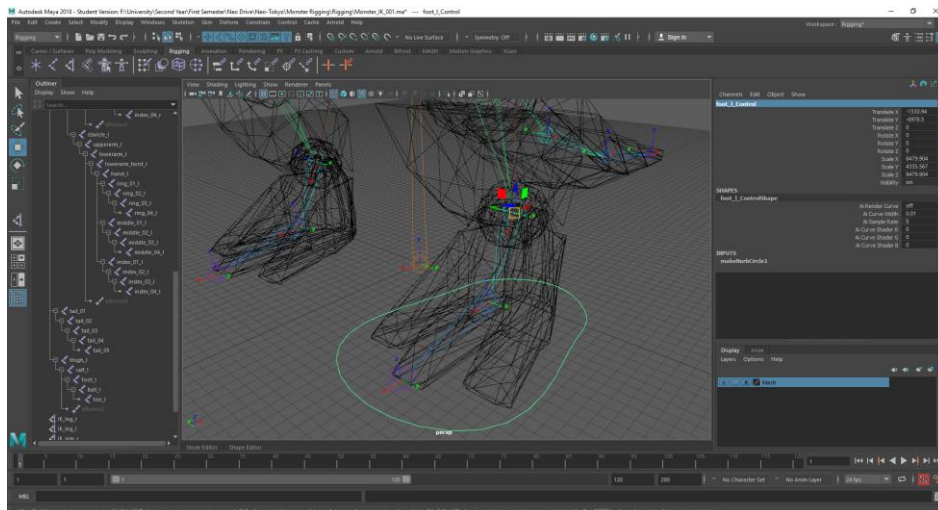
Had to remove skin to allow myself to move the jaw joint and neck_02, this was to allow more dominant joint to control the jaw.



IK's applied by using the IK Handle tool. I used this tool for both the arms and the legs. This will later be working in conjunction with pole vectors to make a realistic walk cycle and attack.

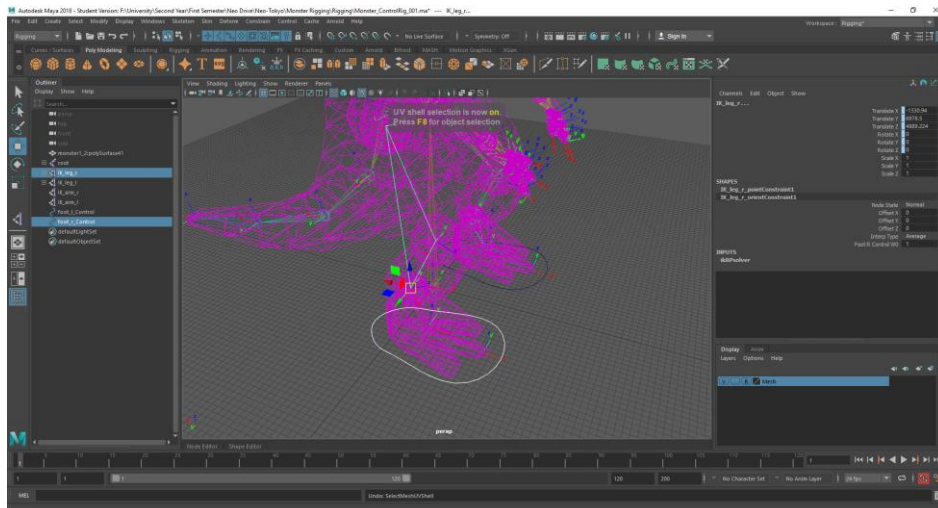


Control Rig



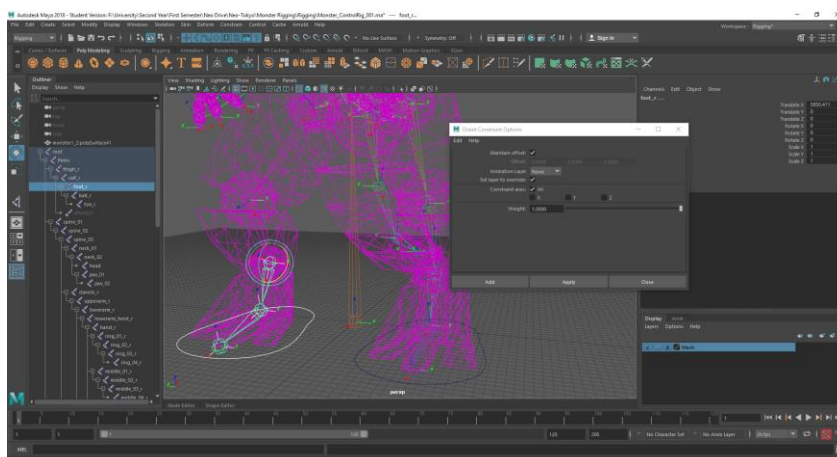
NURBS Circle used and shaped to outline foot, the pivot point then snapped to the foot joint (foot_l).

Freeze transformations and deleted non-deformer history

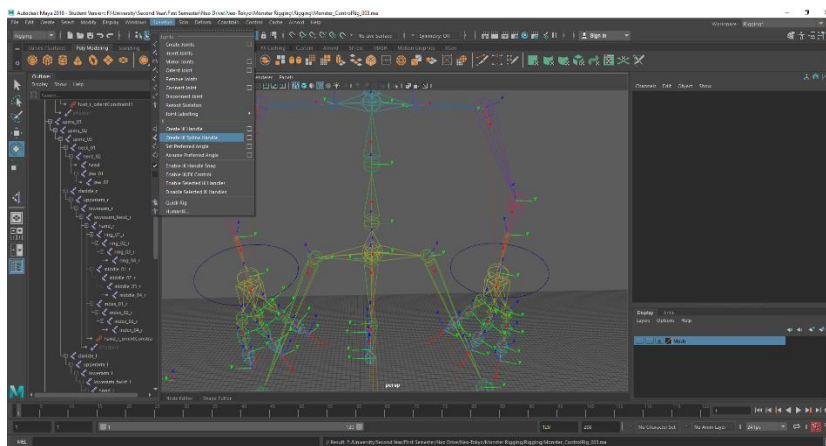
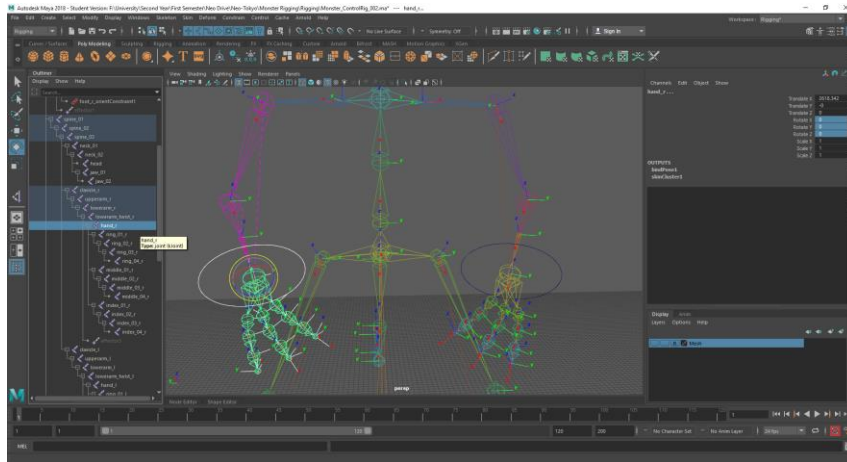


Highlighted NURBS shape, and CTRL-clicked the leg IK handle and used applied point constraint and then oriented the shape via the drop downs

Highlight ControlShape> CTRL-Click IK Handle> Constraint Dropdown> Point



Selected control shape, CTRL-Click foot joint and opened orientation options. Checked “maintain offset”. This will all the shape to also allow rotation from the foot. Repeated for both feet.

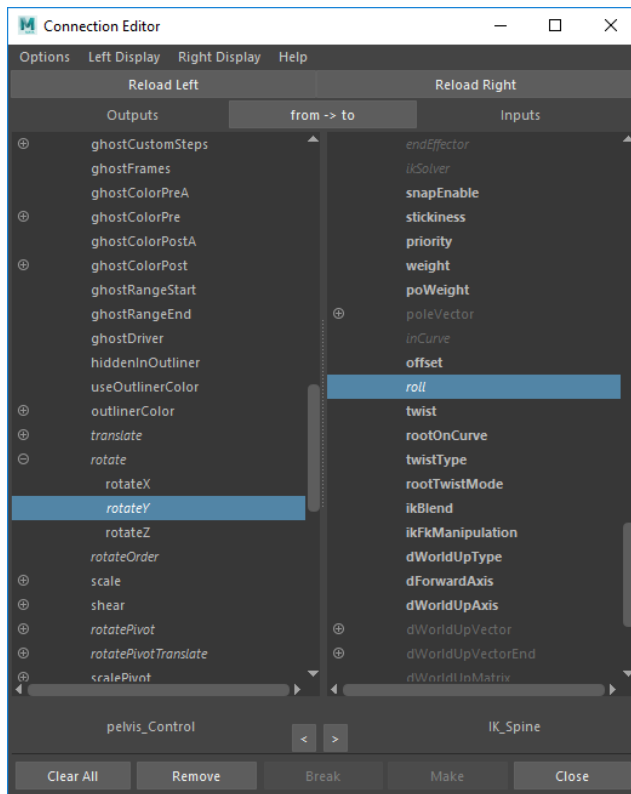


Found and renamed Curve for hip which was shown in the tutorial video, but was hidden within the joint hierarchy, constraint then applied to curve and controller shape

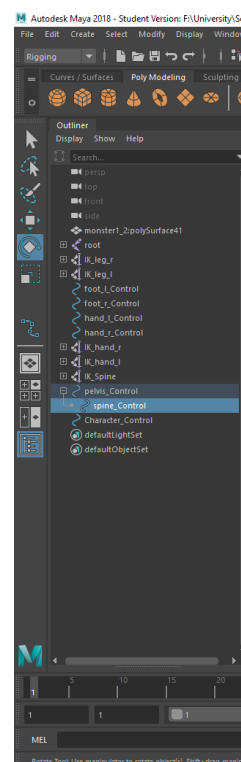
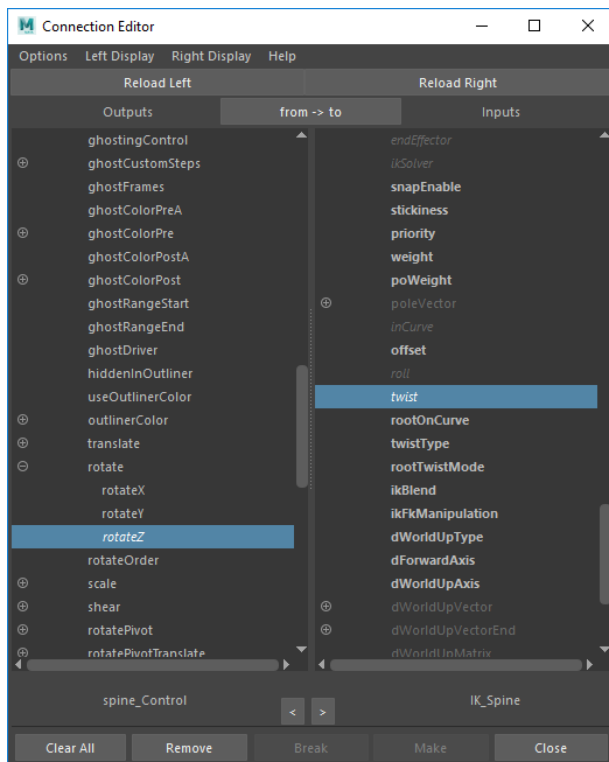
Oriented hips to only orient forward and sideward.

Window>General Editor>Connection Editor

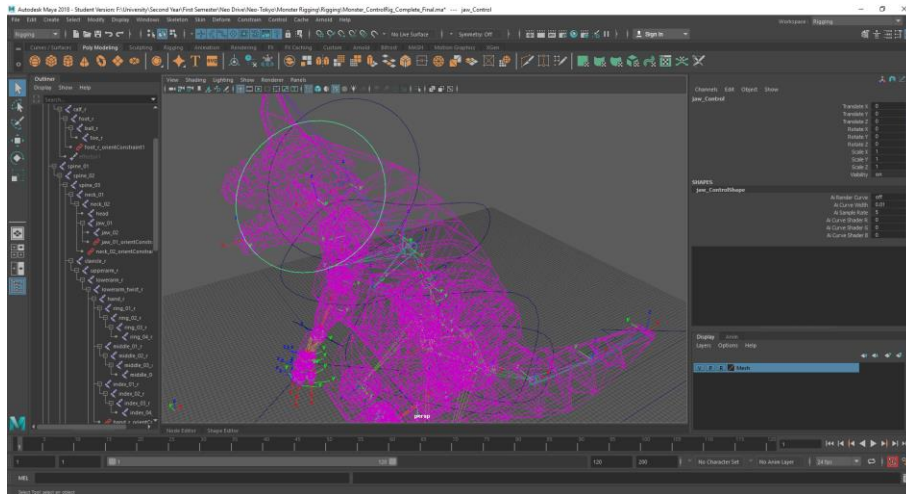
Establishing connection of rotate Y on the controller and roll on the IK_spine.



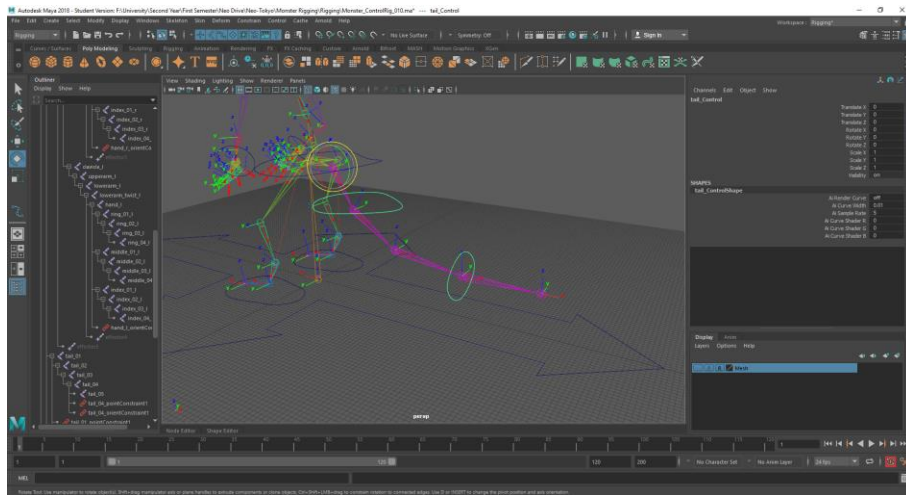
Video I followed to complete this, wasn't using Unreal engine dimensions so Rotate Y is actual Rotate Z for unreal.



changed hierarchy so one force is stronger than the other. This is achieved by using the middle mouse button and dragging the component you wish to place under the other component.



Carried out same process for the jaw to rotate via a control NURBS Circle.



Repeated the process and used constraints and orientation in conjunction with NURBS Circles.

Put it under the pelvis_controller.

<https://www.youtube.com/watch?v=AK34DUULP6I>

Considered implementing finger controls, but after going through the ideas for animation we have found the fingers will not be drastically animated and could be moved manually and then later, if the fingers are needed I can re-rig the model with finger controls

23/11/18

New hands requested, and re-rigging attempted

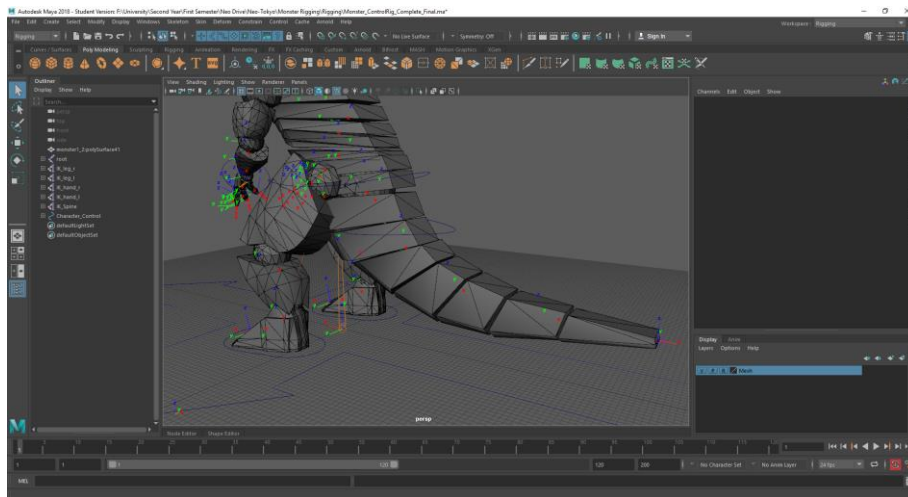
New hands made in scene

New hands rigged up

New hands unable to be mirrored and manually oriented due to potential external forces applying on each joint in the hierarchy

Fix: Selected and group the master rig, and then use previous joints as vertex snaps to align another set of joints that can be manually oriented due to the joints not having to obey any additional values in the hierarchy. Will the replace old arm rig with new arm rig and orient as desired.

Due to the time constraint and avoiding bottlenecking the animation team, I have made the executive decision to carry this process out later in next semester, as the blockout (proxy model) is only needed for basic animation. I will skin the proxy and then upload the scene for animation.

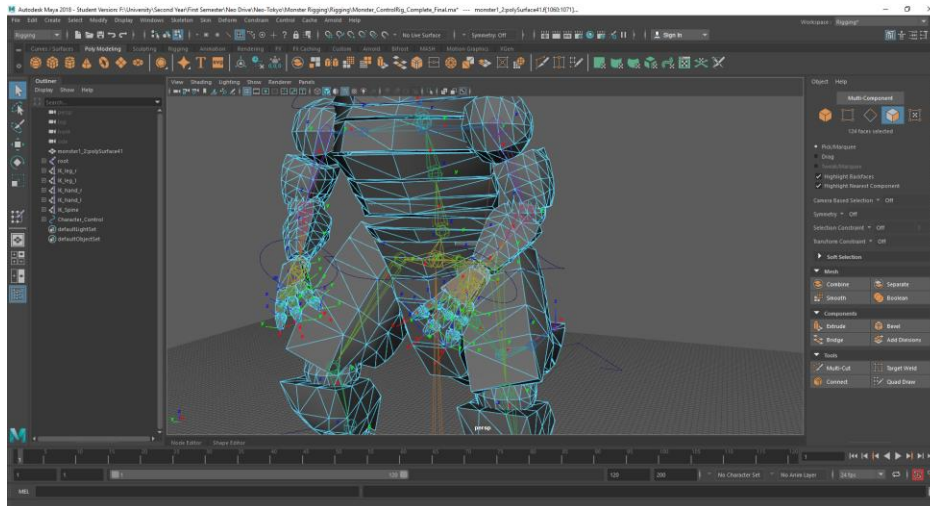


Received feedback from animation team and they told me they can work without the “lowertail_Control” handle, which was giving me issues as it had residual values on its rotation. To fix this I removed each of the constraints. Point and orient, and then removed it from the control hierarchy connected to the main tail controller. This allowed the tail to move freely and can be zeroed. However, after analysing the model and going through previous saves, I discovered the tail has been transformed upwards, despite the rig having been zeroed and non-deformer history deleted. This occurred while I was connecting the “pelvis_Control” to the model and the “IK_Spine”.

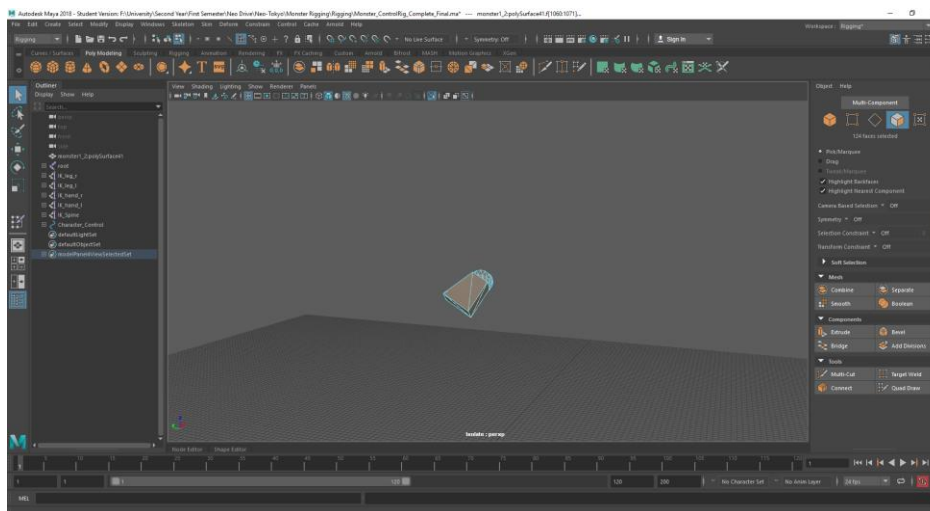
Skinning

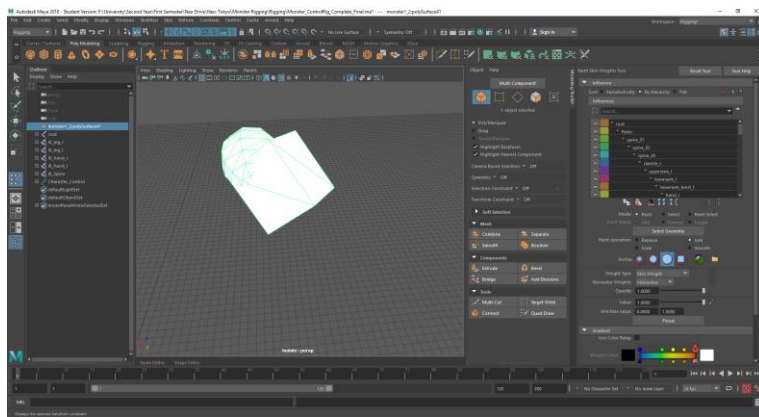
We used a basic skin tool within Maya 2018 to allow us to test that some of controllers to work, however this is very basic and sometimes puts weights on parts of the mesh that aren't necessary. Therefore, we are manually going to alter the weights to each joint. This is done via

Ensure model in the Layers displayer is no longer showing "R" for reference>Select Mesh>Skin Dropdown>Paint Skin Weights Options



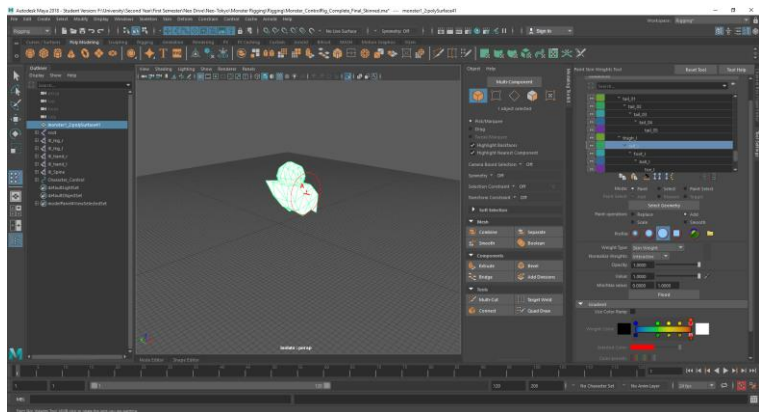
Painting skin weights was made very easy by isolating aspects of the mesh using the CTRL-1 Hotkey,



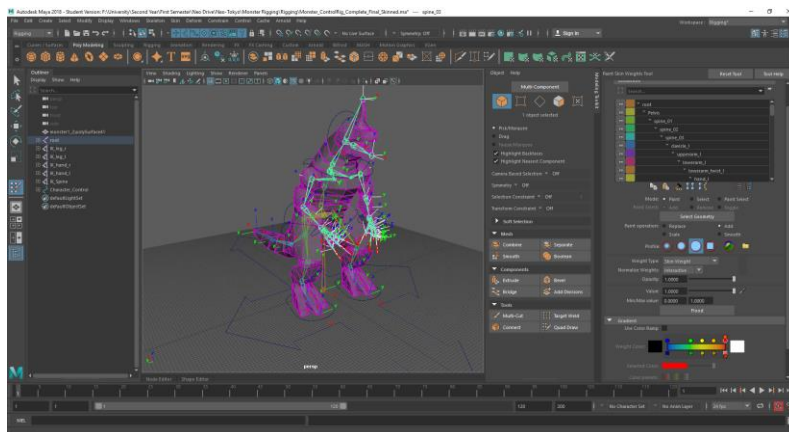


Altered viewport as to isolate a piece of mesh I would need to shift-double left click the meshes and then press CTRL-1, then go to object select, then tools, then previous tools.

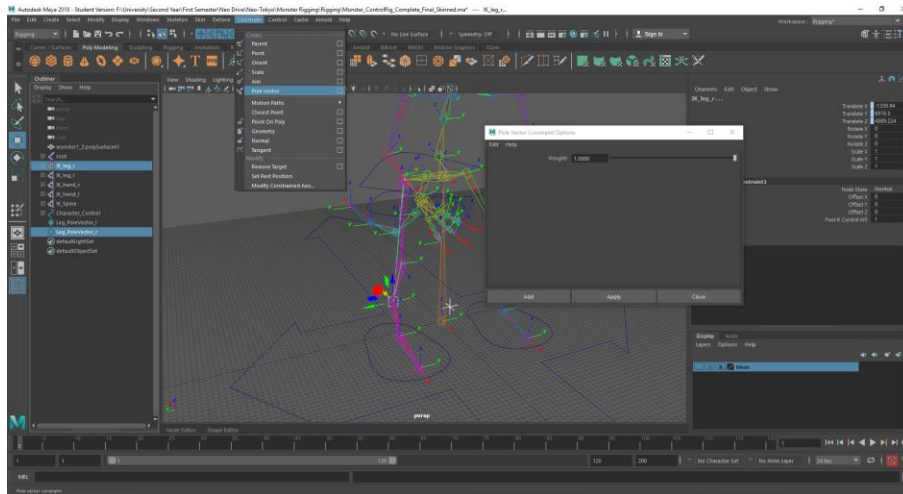
Altering the viewport to this made this process more efficient to carry out.



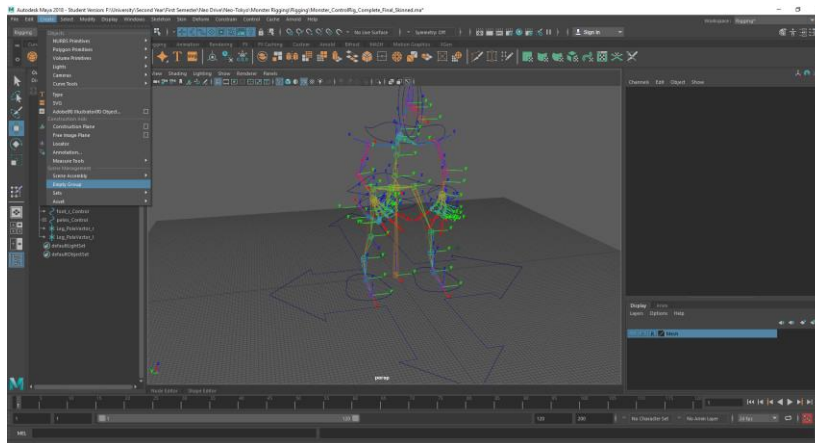
With the feedback I gave to the proxy modeller I also saved a lot of time due to the ability to section off the knee and the shin of the character and just paint the whole section with the value of one for the sake of the proxy.



Weights painted on sufficiently for a proxy model. Double checked using the tool viewer to double check each individual joint influence. I uploaded my model to the drive to give access to the animation team and if any feedback was required, I could do in efficient time.



Applied Pole vectors to help keep the knees and elbows aligned. Connected a locator, used naming convention. Snapped to vertex in the calf joint. Scaled locally for visibility, moved outwards on the x-axis. Froze transformations and deleted non-deformer history. Used drop downs as displayed to add pole vector to the selected Locator and IK.



For housekeeping I made an empty group via the drop downs shown. This group will be used to house the IK handles within the outliner. Then parented all the IK's in the outliner into the group.

Pole Vectors also formed for the arms IKs.

Put the mesh in a layer, the Skeleton in another layer and finally the controls in the last layer. Set Mesh and Skeleton to reference and will only be changed if singular joints require movement by the animation team.

Uploaded to google drive for animation team to use.

Overall, I found this rigging process interesting and required me to understand the process of each control and constraint implemented. This was also my first addition of a tail within a rig and had to take the information that I had learnt last year, I found the addition was not too difficult however, I will need to wait on feedback from the animation team to improve. I also had used the material provided last year to carry out some of the processes such as Pole vectors, same as manual orientation via the legacy viewport. However, using some new material found on YouTube allowed me a fresh outlook to see if I could learn any way of speeding up the process, and the overall efficiency.

Due to the complication with the proxy model after my rigging and skinning was complete, lead to the potential of a snowball effect. I realise the importance of achieving a proxy model confirmed and without the desire to change. I found that trying to change the orientation of the arms with new hands to essentially break the rig. Therefore, requiring me to un-parent the joints from the arms and then potentially must do both the left and right hands again. This was a very time consuming and meticulous process and would have made the whole animation team bottlenecked on me, and the completion of the rig. Also due to the speed of receiving the proxy for rigging lead to me with a very limited amount time, and essentially pushed back my time management an additional two weeks. From this I have learnt to push the issue with getting the orthographic for the characters as soon as possible to enable me to stick to my Gantt chart project planning.

GDD - 26/11/18 - 29/11/18

Previously discussed in a team discussion what topics inside the Games Design Document that everyone should have. Equally distributed among the team and working within the strengths of each member we allocated suitable topics. I was assigned "Backstory" with Connor as we both had an extensive concepting session outside of class hours. Therefore, we were able to just translate those notes into backstory. Also had the "Game setup screen", this was assigned due to my application with flow charts to organise the process. "Level type and full level list" as a level designer, this was given as I have the role of level designer. Finally, "Bonus Material", this was given due to fact no one claimed it. I have discussed the future of the product and later features we wish to implement at a later stage several times, so I was able to fill this section.

After discussing with Connor, we decided to both share the "Backstory" and "Overview" section. This was due to the fact we both worked on each section and found we both wanted to do parts of each section. i.e. I wanted to break down comprehensively the concepts we made and the context behind mechanics. Whereas Connor wished to create a catchy pitch for the game. Therefore, we compromised and swapped some tasks.

While working with the other level designers for the level list section of the GDD, cooperation and keeping the format uniform required more communication to complete.

Presentation - 26/11/18 - 5/11/18

Began the to structure the presentation for submission next week. Discussed layout with Nathan and Mitchell to ensure that the layout was enough for them, with enough slides to allocate 5 minutes for each presentation.

We analysed the template provided by our lecturers to formulate a structure to display our planning, research, work and references.

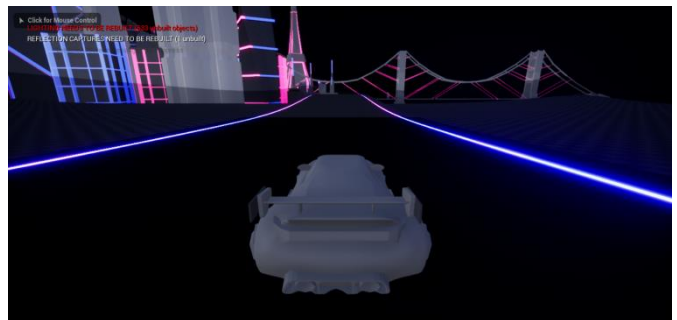
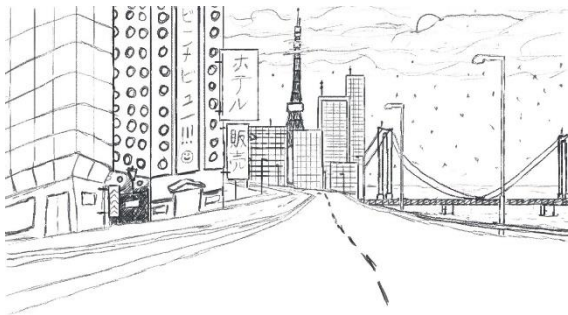
We had a small team discussion consisting of the team working on the "Neo-Tokyo" level and gave the presentation a theme to give our presentation a professional appearance. This was decided on and was put onto Google drive ready for filling in by each team member individually.

Feedback for Rig – 04/12/18

After the animation team had carried out work using the rig, I have received feedback on the tail from Noah. I have been told that when using the tail to animate, it would have been very useful to firstly, have a control on the lower end of the tail. In addition to that, the implementation of the secondary spine IK handle along the tail. This will allow the orientation of the tail to be very dynamic and allow the animator to manipulate the tail to the desired shape.

Level Development and End Result

Through several team discussion between me and the unreal team, we went through meticulous play testing session where we analyse the sections of the game. Through these I gained critical feedback on the level and made alterations to the level. During the process of the engine team learning new skills we also had the situation where members created dynamic and exciting assets. These assets I opted to implement and really showcase, as they bring personality to the level and really set the tone for the area. Near the end of the development stage of this semester we had numerous focal points staggered around the map and each get a showcase. These are however subject to change and we plan to only improve the structure and flow of the level in next semester with the addition of post processing and textures.



Conclusion and Reflective summary

Overall, the general feel of the semester I feel that I felt like my planning was not as accurate as projected, but I show that I can adapt and put in the hours to complete tasks when finding myself with the potential to bottleneck other people with their work. I have discovered the importance of ensuring that orthographic are accurate as the procedure to change something after everything has been rigged and skin, is not impossible, but can be completely avoided with a little more extensive analysis of the model. I have also learned the importance of also pushing for the orthographic to be done and a proxy provided for rigging is something to set as a high priority to ensure high quality animation. Due to my time implication I found myself having to make the decision to prioritise completion of work and making sure that I leave enough time for all modules to be completed in time for feedback. This semester, I worked with new peers and communication was frequent and impactful. However, I have learnt more of what I need to ensure my work avoids bottlenecks and will push this agenda next semester when we develop the game further. I have realised the importance of maintaining communication with all members of the team. It is important as it decreases the chances of bottlenecks occurring and a domino effect causing excess stress. Due to the team being class wide, communication is something we can work on moving forward and develop in next semester.

References

The Fast and the Furious: Tokyo Drift. (2016). [DVD] Directed by J. Lin. United States: Universal Pictures.

University sources for Rigging

Part 1 (Lower body) - <https://www.youtube.com/watch?v=fmtNOlarv1c>

Part 2 (Pelvis, Spine and Neck) - <https://www.youtube.com/watch?v=1CcDDurvqzg>

Part 3 (Arms) - <https://www.youtube.com/watch?v=sypg3OUuYdY>

Part 4 (Fingers) - <https://www.youtube.com/watch?v=dEKOvsAvSm0>

Part 5 (Joint Limits) - https://www.youtube.com/watch?v=osHZTv_CKXU

Autodesk Maya 2018 - Simple Character Rigging

Part 1 - <https://www.youtube.com/watch?v=cOokoFED7QE>

Part 2 - <https://www.youtube.com/watch?v=LWrKiOKuK4o>

Part 3 - <https://www.youtube.com/watch?v=AK34DUULP6I>

Naming Conventions Diagram - <https://moodle.uwtsd.ac.uk/>