

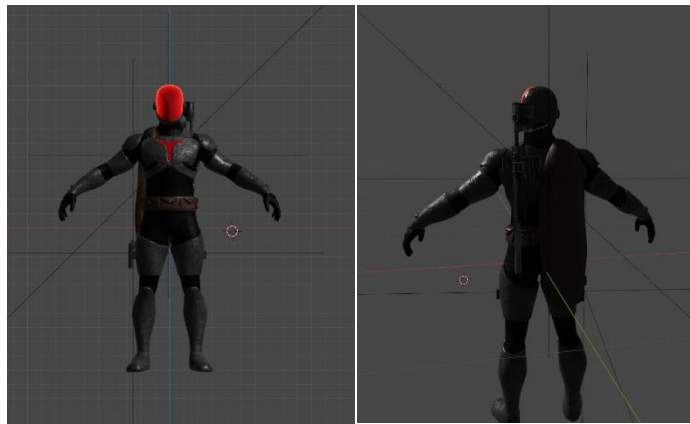
3D CHARACTER ANIMATION

Lachlan shanks
635442

Character reflection:

To start off with the character animation I firstly began with editing my character that I have already created. The reason for doing this was to lower the polygon count so that my computer would run fine when rendering the final animations and to make things slightly easier for me.

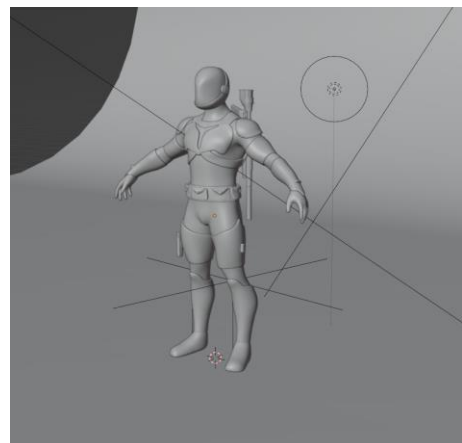
I also used this time to fix up some issues that I had before with my character. For example, I did not like the original texturing on the character and I felt like it look to clean. I changed this by adding a more rustic looking metal to the texture to make it look more worn.



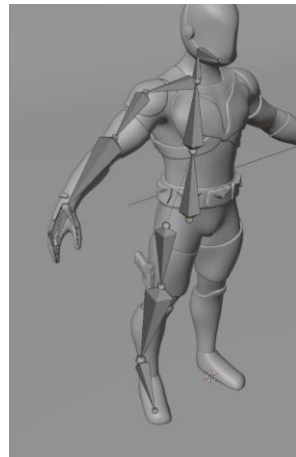
During this process I had issues with the cape and animation it, so I decided to delete it and come back to it later after I have finished all the animations and add it as an extra level of detail.

rigging/weight painting:

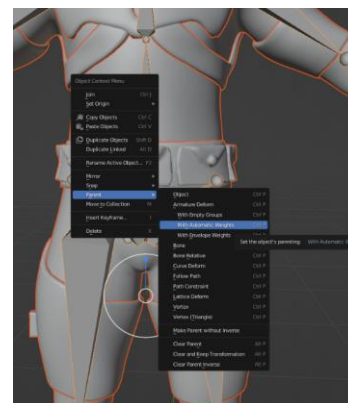
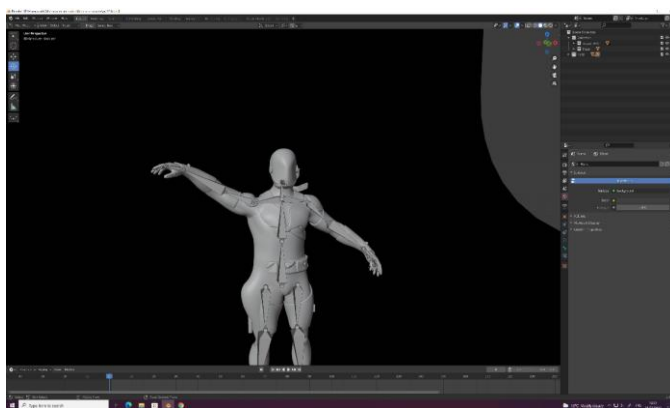
after importing my character into blender and fixing all my issues I had with the character I then built a basic scene for my character. I did not know if I will use this for the final however I wanted to add some lights to the scene and a backdrop.



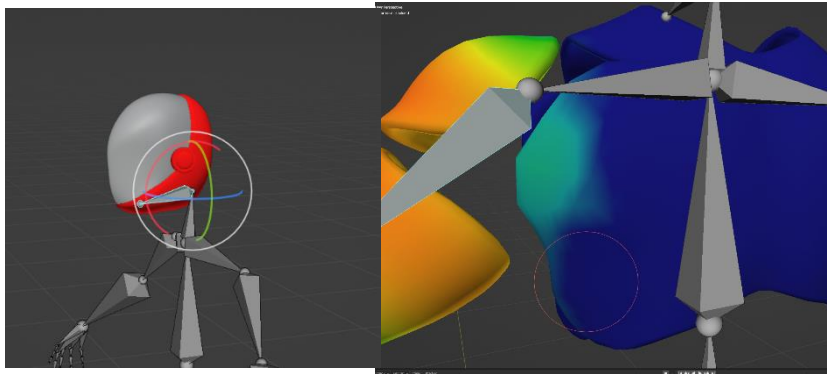
To create the skeleton, I will use for the character initially stated with the middle hip bone as the root. This will be the main bone and the other bones will parent of this on. I then shaped and sized the bone to the position I liked and then added more bones to create the spine and then the neck of the character. Coming off that I then started the right arm with the bones going down the arm and then splitting to the fingers. For the fingers I used one bone and placed it inside each of the fingers. After making sure all the finger bones where in the right position I then subdivided the finger bones to create the little bones and resized and moved them to fit correctly. I then worked on the legs and make all the bones in there. I then had to name all the bones and add “.l” to the end of the name to distinguish if the bone was on the right or the left. I then mirrored the skeleton and renamed the bones on the other side to “.l”



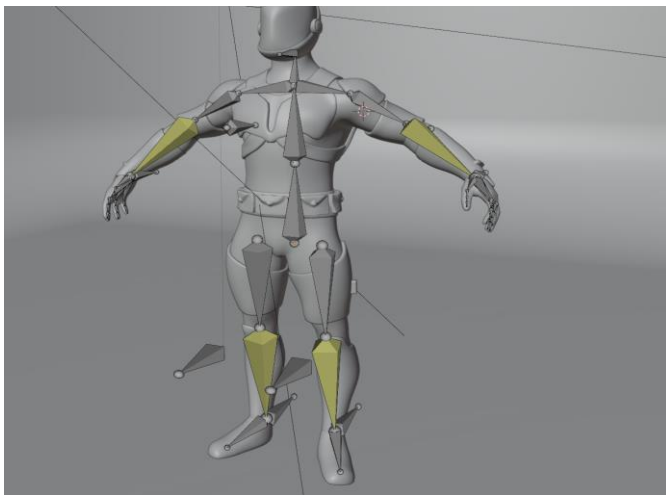
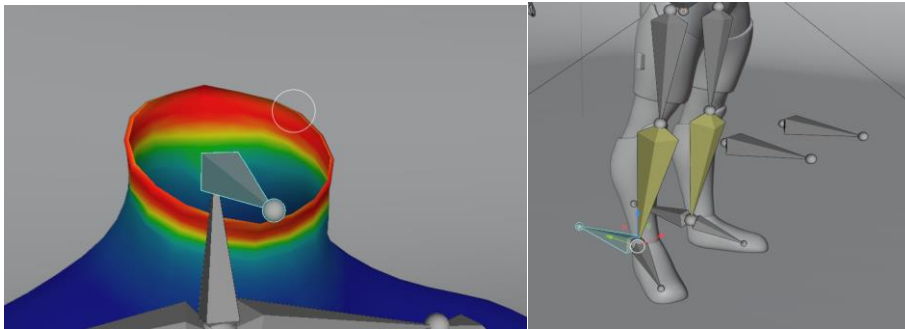
after the bones where set in place I then parented them to the mesh so that they would control the mesh. A problem I had with this after though is that the mesh was being altered in places that I didn't want it to be for example when you move the arm the chest and the lower belly moves



When starting weight painting, I wanted to begin with the helmet. As I believed this would be the easiest to do. I selected the bone that was going to affect the helmet and then painted the helmet fully in red as I wanted the whole thing to move then this bone is moved.



An issue I had to overcome was the under-armour mesh. While working in zbrush I didn't do a good job on making the under armour so there were multiple layers to the armour with gaps in between. This resulted in the weight painting not working correctly as it was the gaps that wasn't allowing me to paint the object fully to allow it to do what I required. To overcome this issue, I had to select all the outer faces and deleted everything else and then added a solidify modifier on blender to give the under-armour thickness. After doing this the painting process was a lot easier.



After finishing the ik for the rig. I then decided to come up with ideas of what I wanted to do with my animations. I wanted to try and do something unique for my character, so I was thinking of an action pose that involves the characters blades that mount on the side of the arm pieces. To start off with the blocking out I began with doing the simple poses that I would need for the animation.

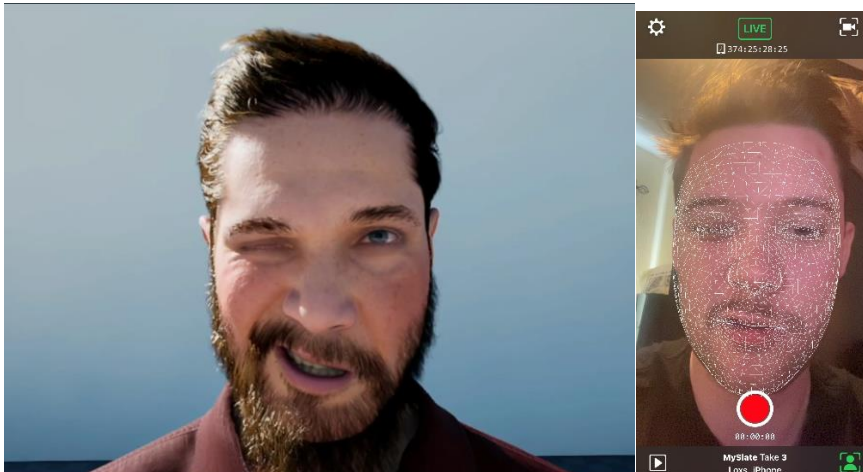
Before I began animation, I decided to play around with different poses to see whether my character would move correctly as I wanted.



After doing this I realised that there were some bones I needed to move and to calibrate with the mesh again, so I did that and added more bones in the spine and the feet to allow for more flowing movement with the mesh. I also added a root bone to the character to allow me to move the whole mesh as one object which I used to move the character from the starting position to the ending position for the block outs.

The principles of animation/animation planning:

Before beginning my animations, I experimented with different software which could help me in the creation of the animations. Of this software was unreal engine live link facial animation software. I decided however to not use this as my characters face is not shown at all during any of the animations I had planned for my character.

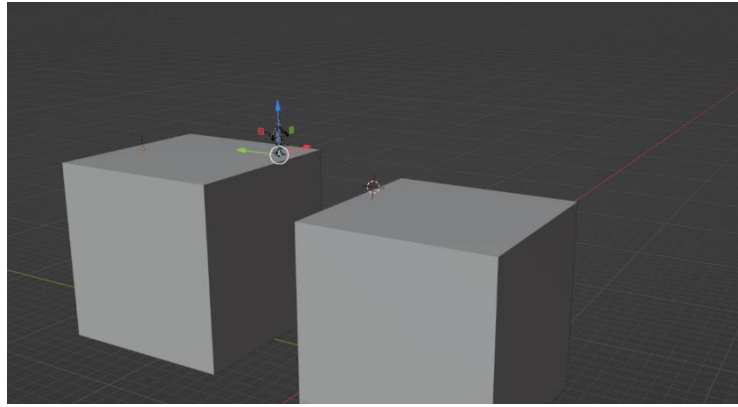


Another software I experimented with was plask. This software allows you to input a video which can then get turned into motion capture data which then can get applied to a character. I thought about using this with a video I created myself for a basic block out however I did not end up using this as I did not need it in the end and instead used other videos which gave me better results hand animating my animations instead with a video as reference.

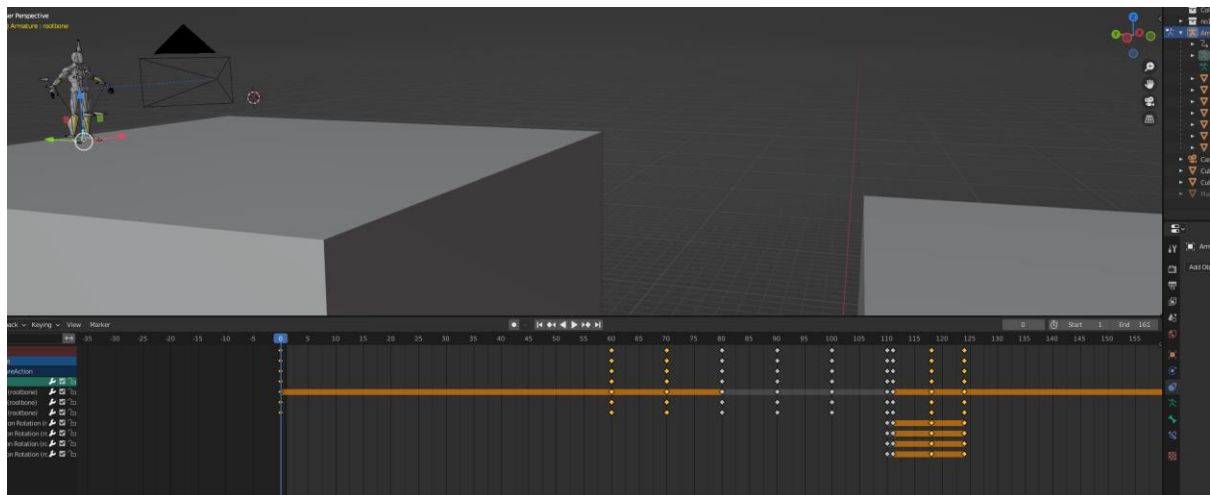
Animation 1:

For my first animation I decided I wanted to do an animation where my character jumps between two buildings.

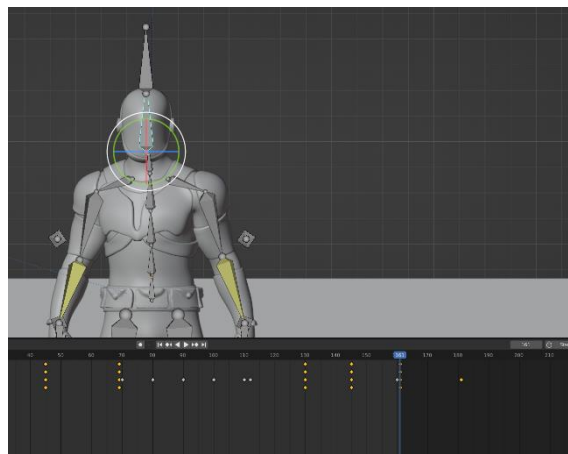
When creating the project, I set the frame rate to 24 frames per second as this is what is typically used in animations and set the length of the animation to 240 frames making it 10 seconds long. I then imported my character into the scene. After this I then blocked out my environment with the two buildings with one lower down then the last so that the character could jump between them.



Using the root bone i then keyframed the points of where I wanted the character. For example, I started the character and the edge of one roof then moved it to the other side then up in the air and then on the other building. I started by moving the root bone so then I have a basic idea of the speed that the character will be going.



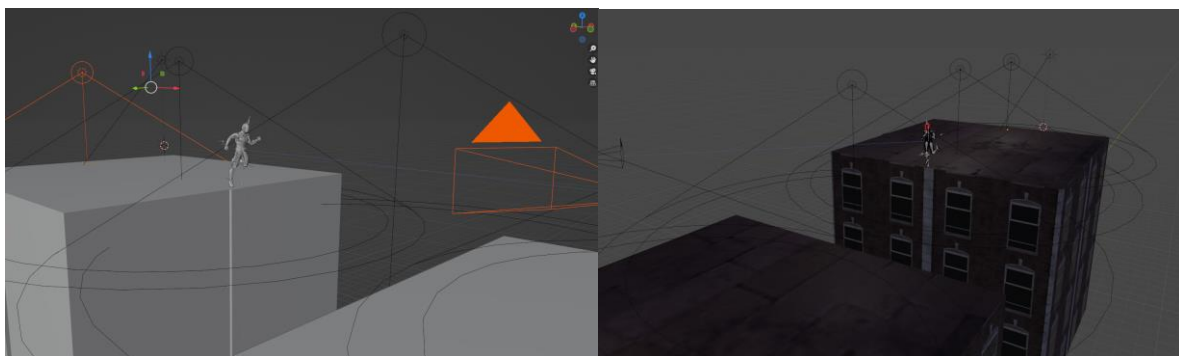
I then used the ik rigs to then move the legs. Using a reference video, I was able to position the legs as they would be if the person was running. To make this easier for myself I moved both the legs at the same time and then off set the animations of the other leg to then create basic leg movements for the character. After animation the legs I then added small imperfects to the key frames like moving the leg slightly on one of the key frames so that it doesn't look to perfect. After doing this I then animated the arms in the same way where I moved them both together and then off set one of



the arms. I then moved some more bones to give the body movement such as the spine bones and the collar bones to give the character more movement in their body and so they didn't look stiff.

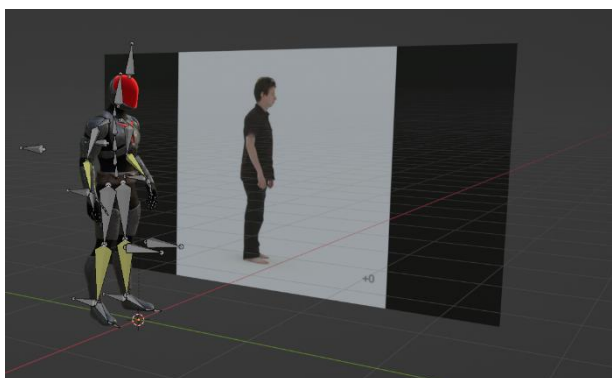
To make the jumping animation I deleted all the keyframes of the running animation that I had there, and hand animate the arm and the legs into a pose that I felt looked right for my character. When the character impacts the ground, I made the character appear to have hit the ground hard by animating the character so that when they touched the ground their body collapsed a bit and immediately comes back up to simulate the impact of the ground.

After the character was animated, I added a camera to the scene which followed the character at a set angle. the belly area didn't look like it was moving so I then added a noise modifier to give the camera a little bit of shake as I targeted the camera to one of the spine bones. I then rendered the animation to see whether it looked good and changed anything I didn't like about it.



Animation 2:

For the second animation I again started with setting the project to 24 frames a second and set the length to 240 frames to make sure it was at least 10 seconds. I wanted the character to walk into a pose. For the walking section of the animation, I found a video which I downloaded and added to the scene, so I had a good reference point to work off.



After the video was imported into the scene, I was then able to move the bones to match the video behind it, I animated each limb individually starting with then legs and then the arms. To add more movement to the body I rotated some of the back bones to give the character more motion.



Once I had the walk sorted I then moved the root bone of the character to the position I wanted it to start at then key framed the end position and had a basic walk cycle. I then posed the character in the default pose and then moved the character into a pose I think looked good as for an action pose.

I wanted some blades to come out of the characters wrists. To animate this I went to the frame I



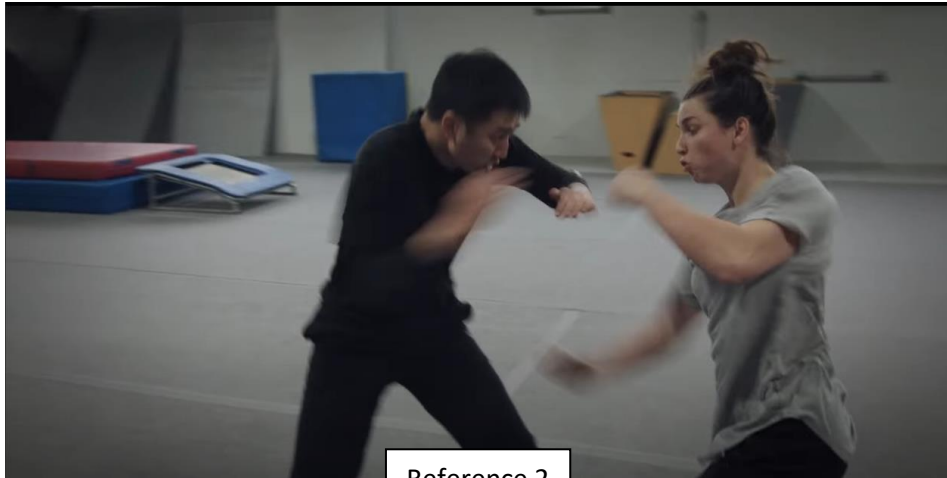
wanted the blades to come out of the wrist on and added two planes shaped like blades and parented them to the mesh. I then key framed them starting off small and extending and then going back small again. I then added an emissive texture and thickness to the blades.

After adding a camera to the scene, I key framed the movement to the shots I wanted to be shown. Finally, I rendered the animation.

Animation 3:

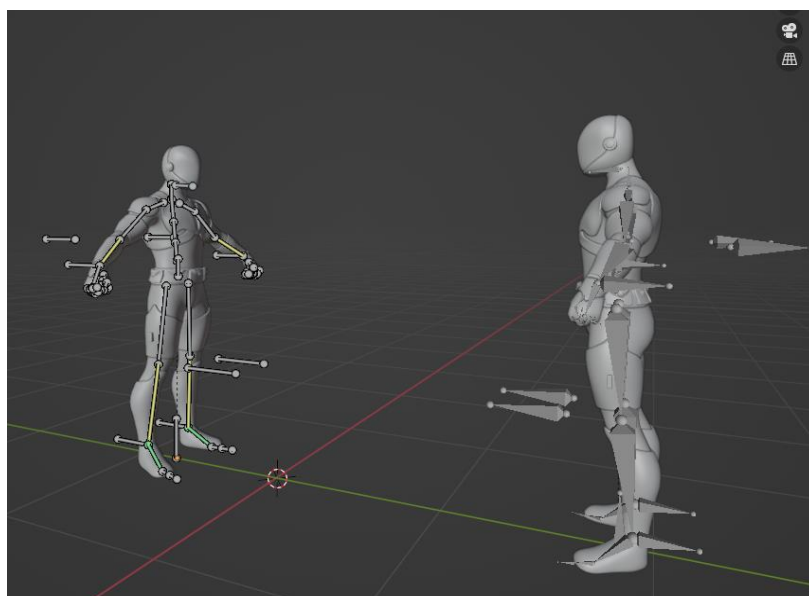
For the third and final animation I started by setting up the project. I set up the project to be 24 frames per second. For my final product I wanted to make a fighting sequence between my character and another character. I found a video of two people fighting and decided to use this

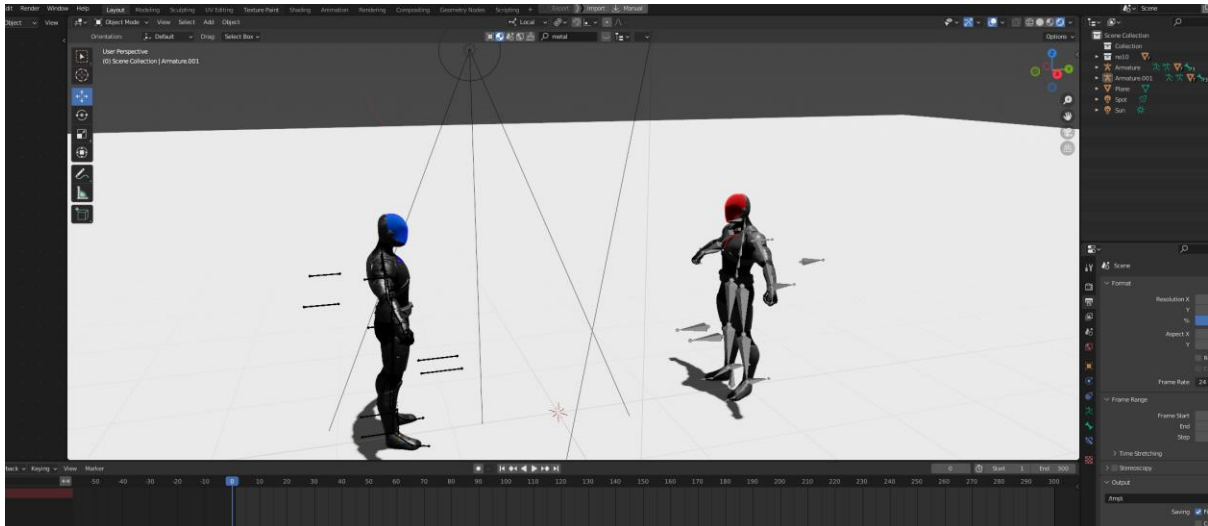
video as reference. I set the length of the animation to the length of the video I was using to reference.



After my initial plan was complete, I then had to decide what character I wanted my character to fight. Originally, I made a military man in fuse and wanted to use this as my character but that meant I had to rig and weight paint it all over again, so I decided instead to duplicate my character that I made and change the texturing slightly by making the red bits blue and the metal armor slightly darker. Also, to not be confused I changed the look of the bones of the second character so I wouldn't get confused when trying to work out which ones belong to which character.

Using the video as a reference I moved the root bone for both the characters in a rough position of where the people need to stand. I then animated the character I thought needed the least animation first and then used that as a reference for the second character so I knew where the places of contact would be. Before I started to render the created a camera in the scene and moved it in a direction like the original video. I also used camera angles to hide any errors in the animation. For example, to create the reach of the punches the mesh clipped through itself but moving the camera around hid that.





References:

Reference 1:

Endlessreferences (2011) Young Adult Male Angry Walk - Slow Motion. Animation Reference Body Mechanics [video] available online:

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

reference 2:

Tyler Williams (2020) FIGHT PRACTICE 20/01/31 [video] available online:

https://www.youtube.com/watch?v=Y_I83QhoYY4