IS53067A: Introduction to Modelling and Animation

Coursework 3

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Summary

I have two scenes in my coursework3 folder. The first one is TankTreadsNormal, this is my main one where pressing play shows the wheels and tracks spinning. This file also has joints on the turret but it is unfinished because I struggled to complete it. This is my main file with materials added as well.

The second file is TankTreadsRigged, this file is an earlier version of the model, it is just to demonstrate how I was rigging the treads on the tank, however this also failed. But I decided to keep it in as a separate scene for anyone to inspect.

I have added a MP4 file of the animation in motion.

History is not cleared on a lot of my objects, almost all of it. This is because clearing history tends to ruin my objects especially the tracks and the wheels so I left it uncleared just so it stays working for the submission.

I learned that not naming things as I create them or before I duplicate them will cause problems, and it makes my outliner quite unorganised, I attempted to organise it by optimising the scene size, however this also broke some of the objects I created so I left it how it was before this.

In hindsight, I think creating a simpler model with less treads, wheels and much less complex shapes on the hull and turret would've made for a much easier time rigging and animating. A lot of time got wasted on trial and error on different files, trying to achieve the same goal with different methods so this is another reason why the model is unfinished.

Introduction

This project mentioned my character could be a vehicle, and the first idea that came to mind was creating a tank that has its tracks animated and turret rotated. The tank I decided to base my model off originally was the Tiger 1, because of its simple square like design, as seen below.

Figure 1 - Panzerkampfwagen VI Tiger Ausf.E (Sd.Kfz.181) Tiger I
Image supplied by (https://tanks-encyclopedia.com/ww2/germany/panzer-vi_tiger.php)

I started to model the turret of the character and I have displayed figures below demonstrating it.

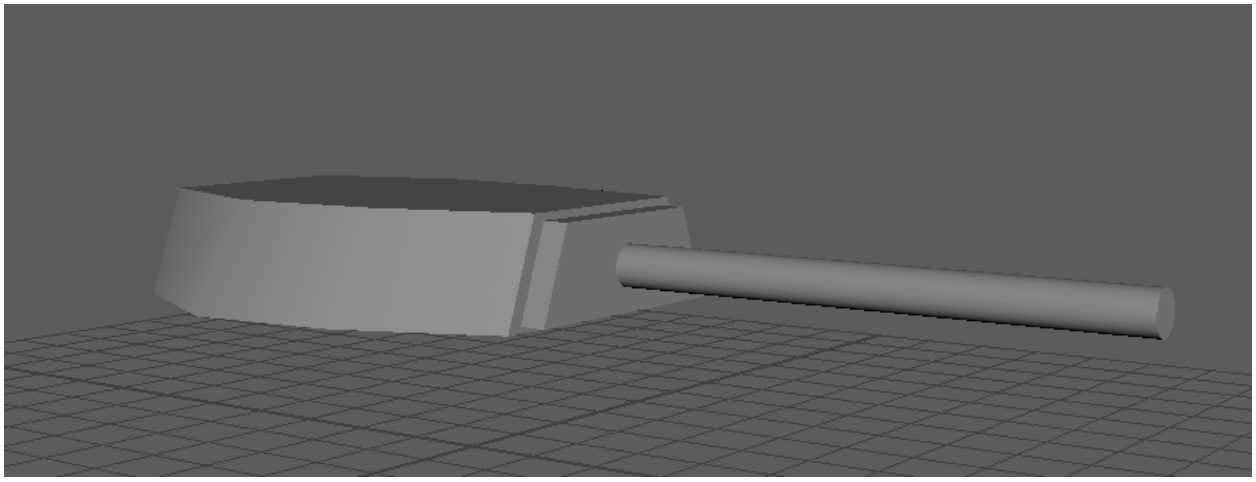


Figure 2 - Early model of the turret for the tank.

While modelling the turret and looking at the rest of the plans I had for the hull of the tank, I decided that it did not interest me to continue modelling this particular tank, as well as it being a bit too simple.

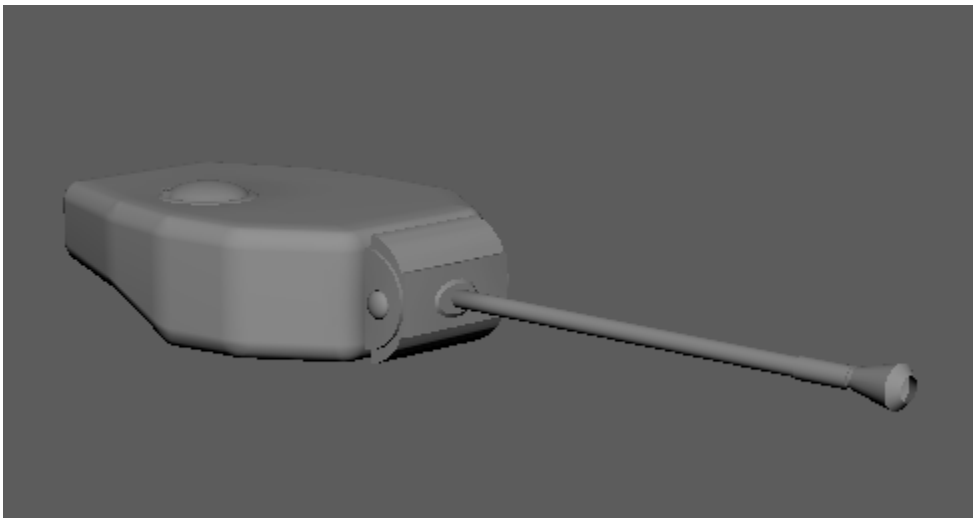
I decided immediately to make my own modelled version of a tank called the M47 Patton instead.

Figure 3 - M47 Patton
Image supplied by (https://tanks-encyclopedia.com/m47-patton-in-italian-service/)

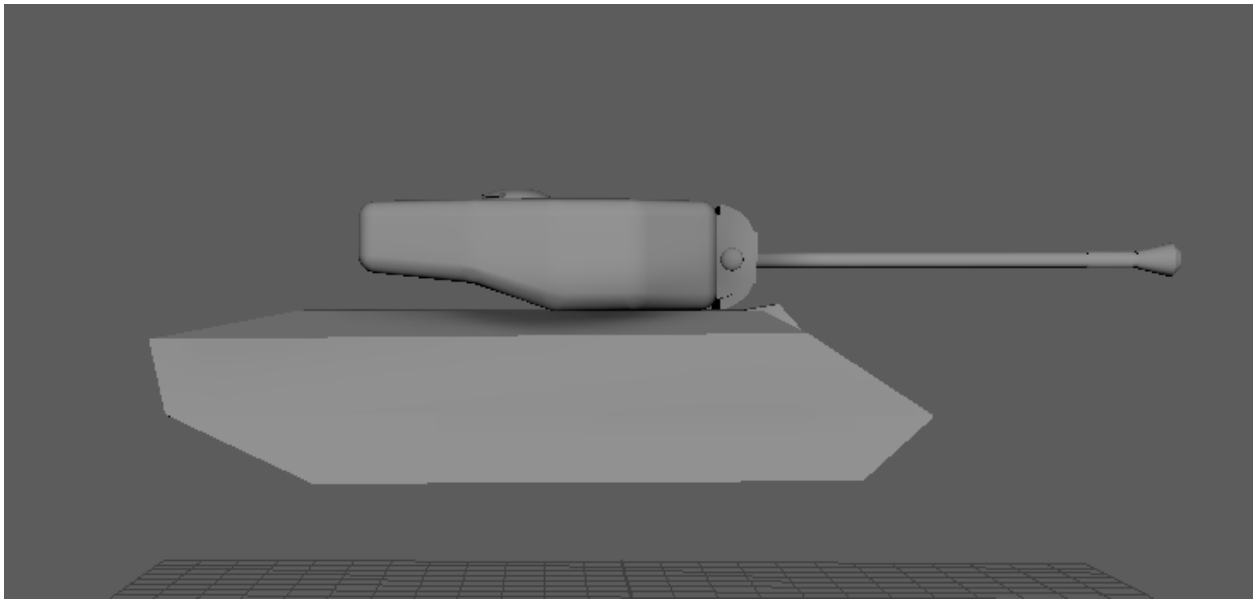
This model will prove a lot more challenging but would make for a more interesting animation. I plan to simplify the features a lot but keep the core aspect of it in place, as to not completely copy it but use it as an inspiration.

Modelling phase

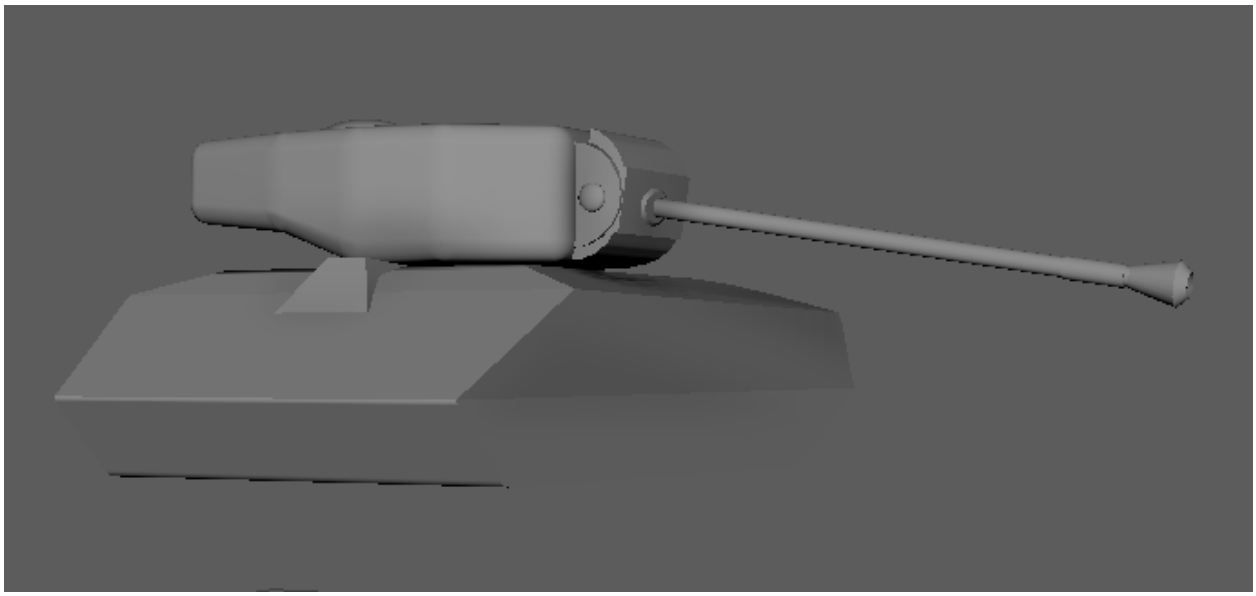
I began by first creating the turret of the model, this was achieved solely by extruding simple shapes into the look of a turret. The finished model is here.



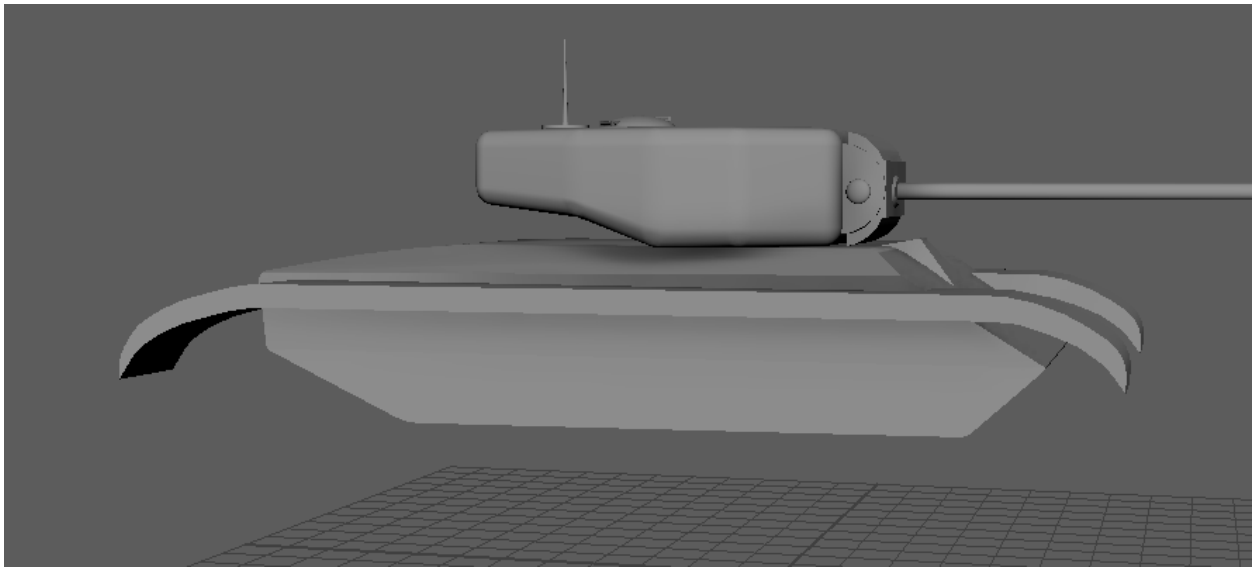
The turret itself is a polygon cube reshaped and bevelled. The hatch at the top of the turret that allows entry to the vehicle is a polygon sphere reshaped appropriately. The gun mantlet is a set of shapes extruded outwards and finally the gun itself is made with a polygon cylinder with extrusion to get its shape correct.



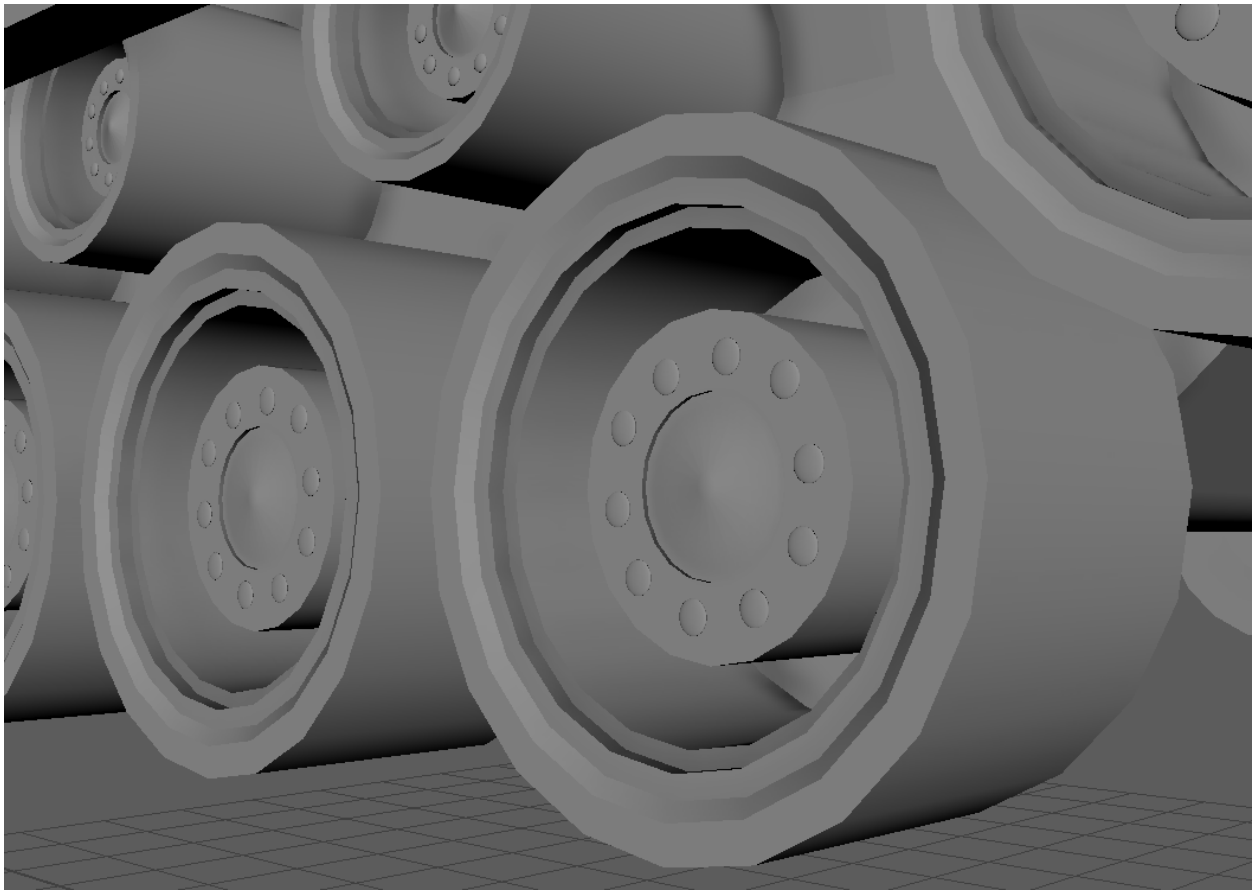
I then began shaping the hull of the tank out of a polygon cube.



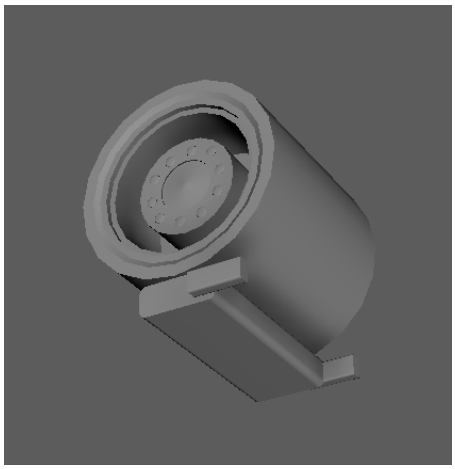
I set pivot points on the gun mantlet and on the turret to be able to adjust them accordingly. The aim is to be able to animate the vehicle to turn its turret and lower the barrel, however I can not figure out a way to make both parts move together as intended without combining. When the parts are combined I am only able to create one pivot point. Hopefully further into the assignment I am able to overcome this dilemma.



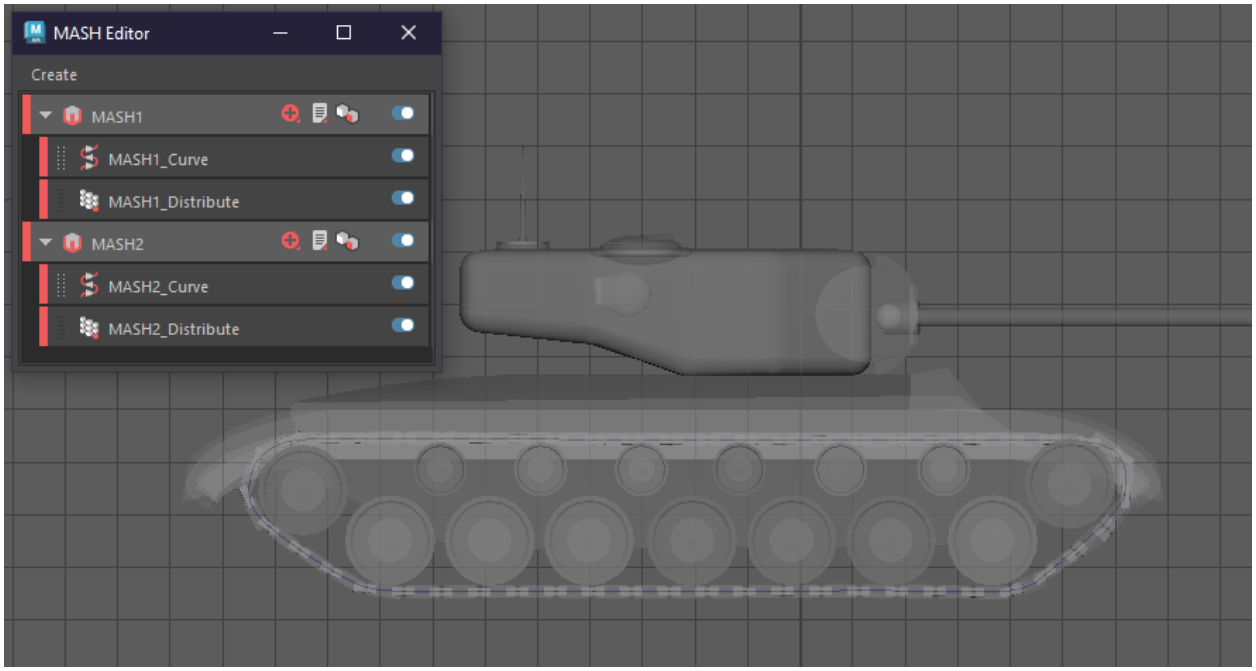
I attempted to add a more complicated look for the armour that sits on top of the tracks, but I failed to make something that looked normal so I ended up with this basic design.
I also created a boneyard at this point for each shape in case I needed it later.



The wheels were as simple as doing some extruding on a poly cylinder.



I made the treads by creating one segment and duplicating it along a curve that I aligned around the wheels. I sized it against a wheel in my boneyard before this.

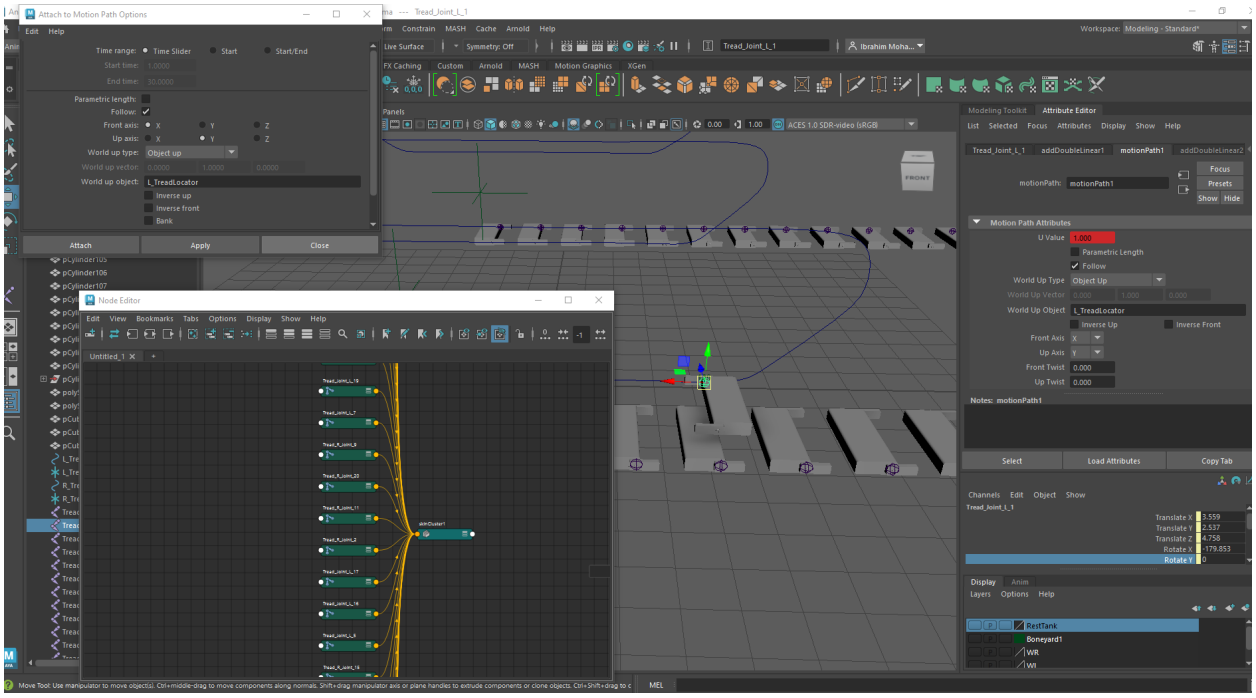


I ran into some problems when putting the tread onto the curve, this was because I had already freezed transformations on the shape before putting it on the curve, therefore I had to reset its position to the centre of the canvas. I used MASH editor to set up the tracks and in the end they all sat nicely along the wheels and are animated to rotate.

There were some errors that I noticed towards the end of modelling which I will fix at the end of the project if time allows. However at this stage rigging the model is the most important thing to do.

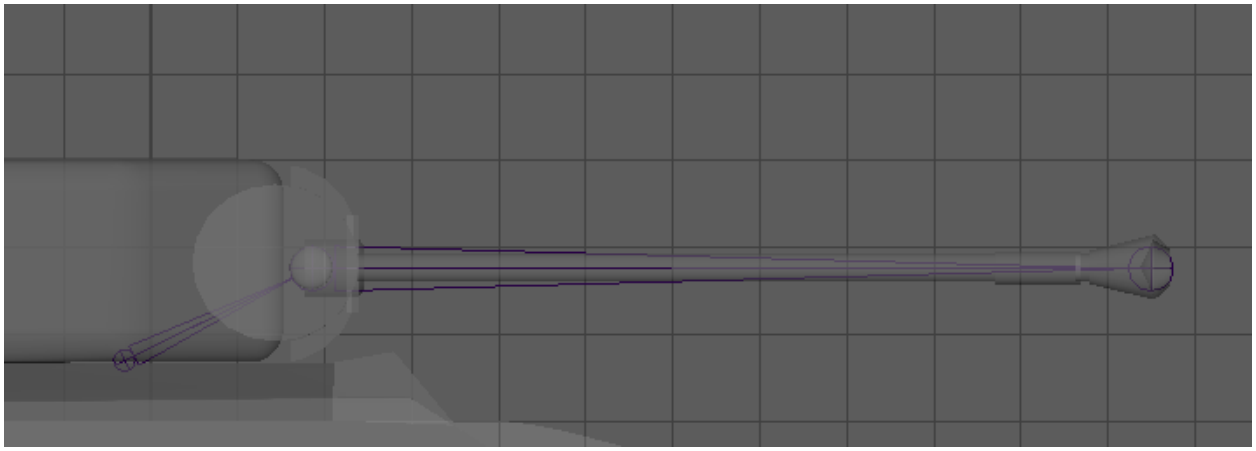
Animating and Rigging

I began by creating a copy of the original folder and keeping it as an extra in case something goes wrong.

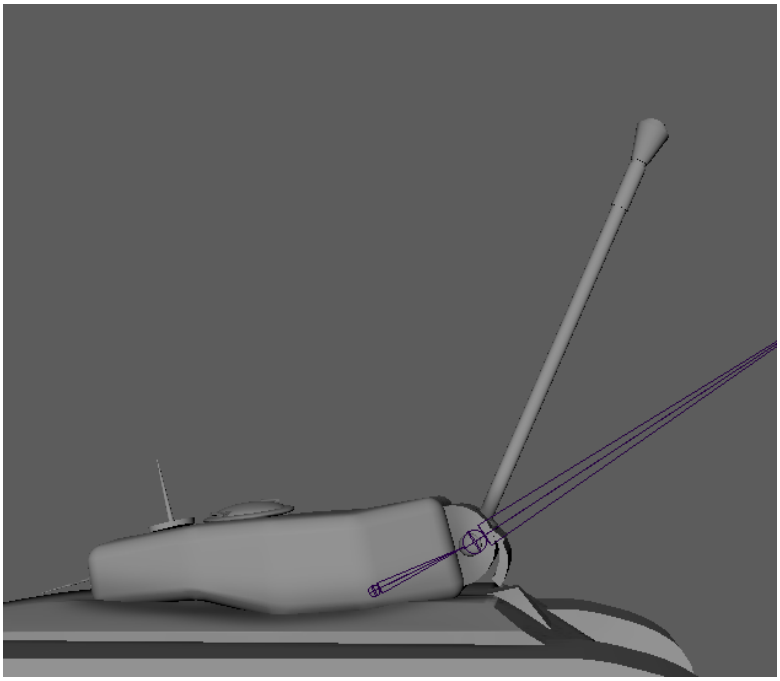


I started by remaking the treads altogether. I went through a process of adding a joint to a tread piece and duplicating special, on them up till there were 20 on each side. Where I started to find my first big issue was the lack of experience in this sort of thing, I had a lot of trouble binding the tread to the curve, and the node menu and U Value started to cause a big confusion.

Working on the turret I added three joints, one at each point of the turret; the turret, the mantlet and the barrel.

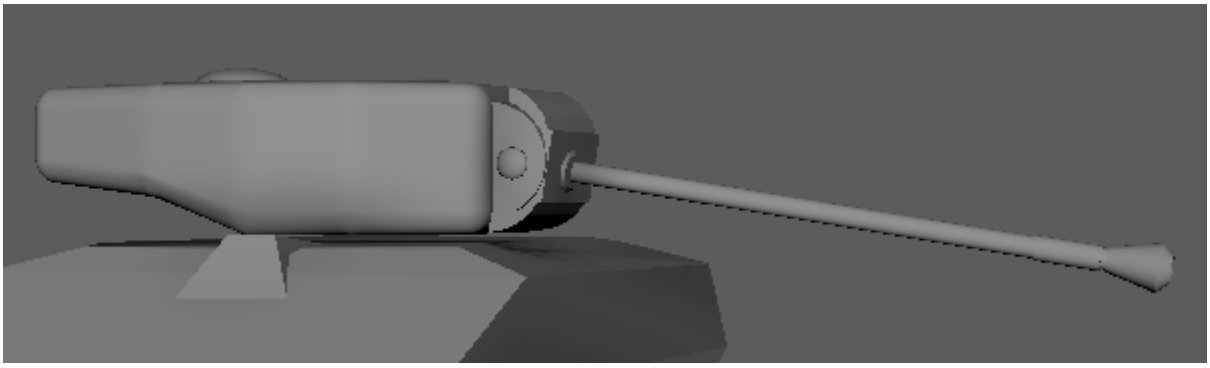


My process to try and get this working was to add the joints as shown, and then skin them to the model. Then I opened up component editor, selected the vertices that I wanted to add and set their values to 1. No matter how many times I re did this step I could not get the joints working properly on the turret. They would keep appearing like this.



Deforming the model. Double checking that i've done everything right it still continued to appear like this, I even tried to simplify the model and try again to no avail.

This is how I wanted the turret to look when moved with joints.



UV Mapping on the tank did not come out right correctly either and I again wasn't sure what the problem was since I followed the exact steps I took on assignment 2.

Citations

Textures from Poliigon.com
https://www.poliigon.com/texture/rust-mixed-on-paint-012/1532