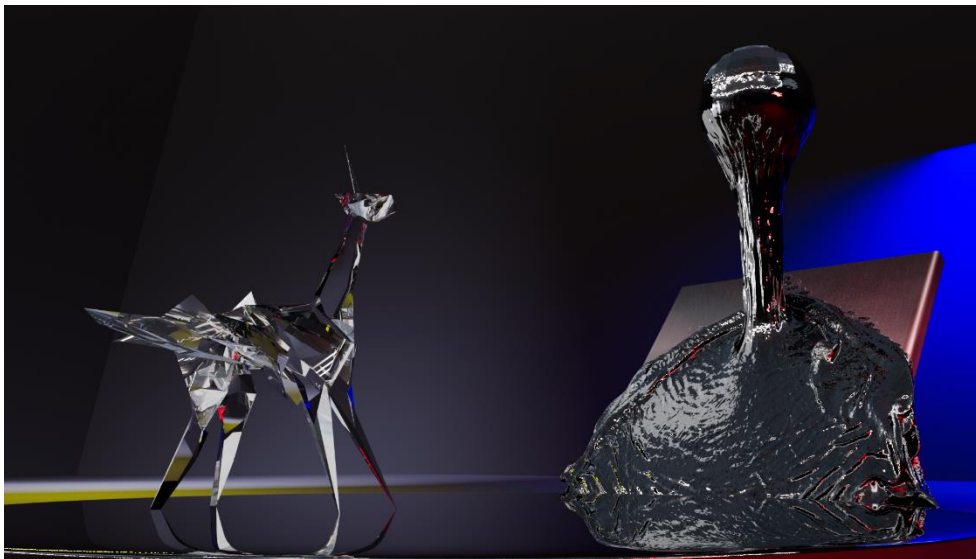Goldsmiths, University London

Introduction to Modelling & Animation IS53067A

Coursework 1.2: Lighting and Texturing

Philip Kinshuck
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I have included 3 project scenes in the Maya project folder

- **Final_01_Basic** contains all the models animated with no Bifrost simulation
- **Final_02_Bifrost** contains all models with Bifrost simulation
- **Final_03_Unicorn** scene dedicated to showcase unicorn animation with Bifrost.

Model 1: Deckard's PKD Blaster

I decided to texture this model closely to the Blaster used in the original movie, however due to some lack of detail in parts of my model I have added some extra features and experimented with a variation of texture and colour.

Grip:

I wanted to emulate a rubberised grip with some detail and geometric pattern maintaining a futuristic feel.

After deciding on a texture, I begin to apply it to the grip mesh. This was a relatively simple process and once unfolded little adjustment was needed in the UV editor.

Figure 1: Grip Texture

I reduced the specular reflections and adjusted the colour to create a slightly darker shade. Further to this I used the same image as a bump map to allow for extra detailing and texture (figure 2).

Figure 2: Model grip with texture

Figure 1 was also used for the side detailing as a bump map on a metallic finish this can be seen in figure 3.
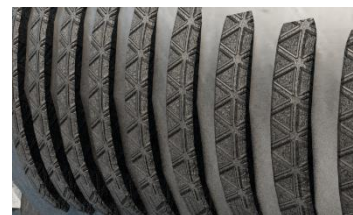
Figure 3: Side detailing with texture

Figure 4 displays the same texture however I decided not to edit the UV map as the finish adds detail in horizontal lines along a cylindrical shape. After reviewing coursework 1.1 I was able to convert the NURBS shape to polygons.
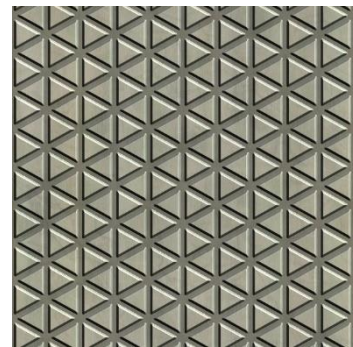

Figure 4: Cylindrical Texture
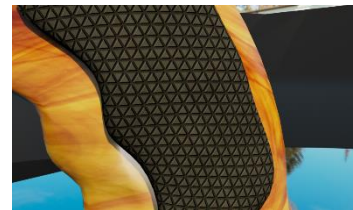
Handle Base: Brushed Metallic Finish.

For the base texture of the gun, I used a brushed steel image.

As the mesh was mainly in one piece at this point, I decided to extract sections of the gun to allow for simple texturing. To do this I selected the necessary faces and used the extract feature in Maya.

Figure 5: Brushed Metal Texture

Applying a standard ai Arnold shader I initially applied a brushed metal pre-set then applied figure 5 to its colour. With some minor adjustments to brightness and colour this texture offered a satisfying result giving a blueish metal finish with scratches to emulate wear.

Once the UV was sufficiently mapped, I smoothed the mesh however on further inspection this caused some disconnection with the main handle body this can be seen as dark sections in figure 6. To fix this issue I pulled vertices from the amber section down and used the sculpt tool to smooth areas creating a fluid finish between the two pieces (figure 7 – 8).

Figure 6: Handle Base

At this point it was necessary to fix the UV map to avoid splits seen in figure 6 and sew pieces that had become separated (figure 9).

This does leave some stretched UV pieces however since the colour in the brushed metal image is not constant it was necessary to allow the brush lines to continue through different segments to create the illusion of a solid piece of metal work.
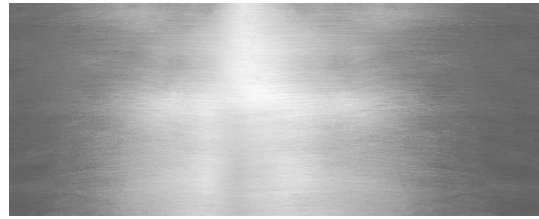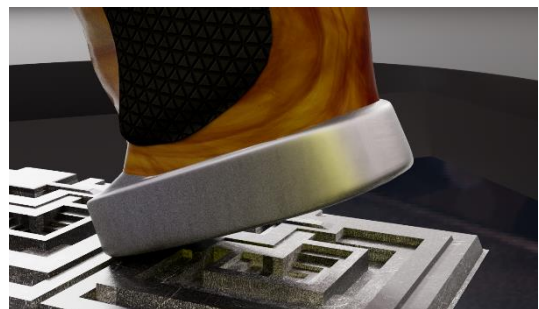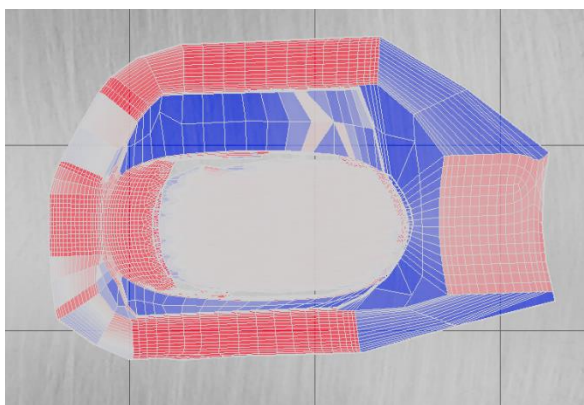

Figure 7: Fixed handle base

Figure 9: UV mapping base using sew

Figure 8: Smoothed base using sculpt tool

Gun main body:

I decided to use the same brushed metal shader which I created earlier. Again, I faced a similar problem with cutting the entire mesh into workable pieces, it was also necessary to spend time sewing pieces together in the UV editor as the texture changes colour (figure 5). This was time consuming but provided a realistic finish as the colour is not continuous throughout leaving a machine worked feel to the metal.

Figure 10: Deformed barrel cover

Figure 11: Bevelled barrel

I intended to smooth the end of the gun however it appears deformed (Figure 10), and it was not possible to obtain the effect I desired. At this point I decided to bevel the end section creating a sharper finish (figure 11).
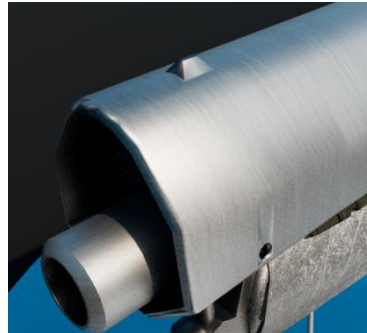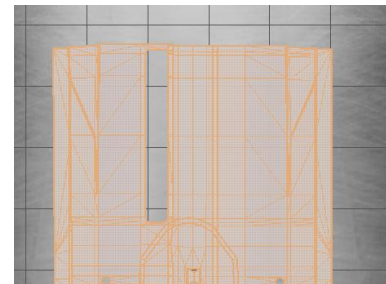

Figure 12: Barrel UV map

Extra detailing:

I felt there was a lack of detail in the gun and wanted to emulate engravings into the metal body. Using figure 13 as a bump map maintained a futuristic feel and provided extra detailing to give a more complex feel. I spent considerable time choosing placement and depth to create a believable etched finish.
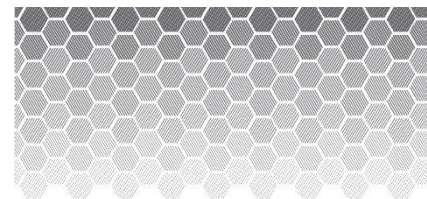

Figure 13: Geometric patten

Trigger Guard:

Due to a poor mesh which I was unable to fix I decided to use a pre-set ai standard shader. I tried to create a dull metal finish. I was disappointed with the result however I have learnt a valuable lesson in creating mesh with good geometry to be a priority.

Figure 14: Engraved detail

I decided to rebuild the trigger guard to maintain consistency throughout the model and applied engraving to continue the theme of the gun. One area I found difficult was after smoothing the trigger guard mesh it was difficult to connect the ends to the main body. I manipulated the vectors with the main body to make the connection as smooth as possible (figure 15).

Figure 15: Fixed trigger with bump map

Front Panels:

I created a new shader using a different metal texture as I wanted parts of the gun to feel weathered.
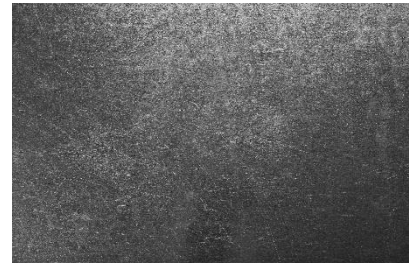

Figure 16: Weathered metal texture

Front panel detailing:

For the circular pieces in the front panel, I decided on a carbon fibre finish for the outer circle and square pieces. This was inspired from the blade runner blaster in the most recent film Blade runner 2049.

Figure 17: Carbon Fibre

Figure 18: panel and side detailing

For the inner circle I used a grid like texture I tried to emulate a dull metal finish.

Finally, I applied a bright red texture for the light in the centre of the circle. This was a pre-set ai standard shader with some specular property.

For the square detail pieces, I used the carbon fibre texture for the outer section and the brushed metal texture for the inner section creating the effect of extruding from the panel.
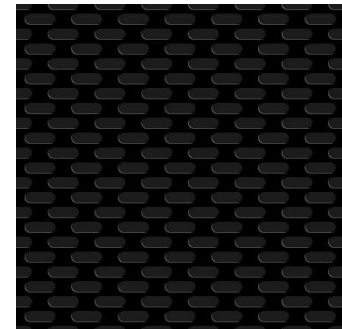

Figure 19: Metal Grid

The front panel of the gun also used the grid texture to contrast the bright brushed metal (figure 11).

Main Handle:

For the guns handle I decided to use an amber texture. Whilst the mesh was stable it was necessary to spend considerable time sewing the faces on the UV editor. This was a significant issue throughout however I have become more confident at this point with my texturing skill.
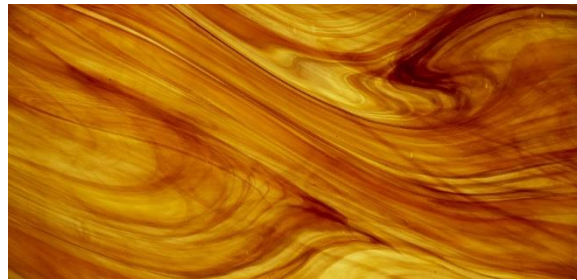

Figure 20: Amber texture
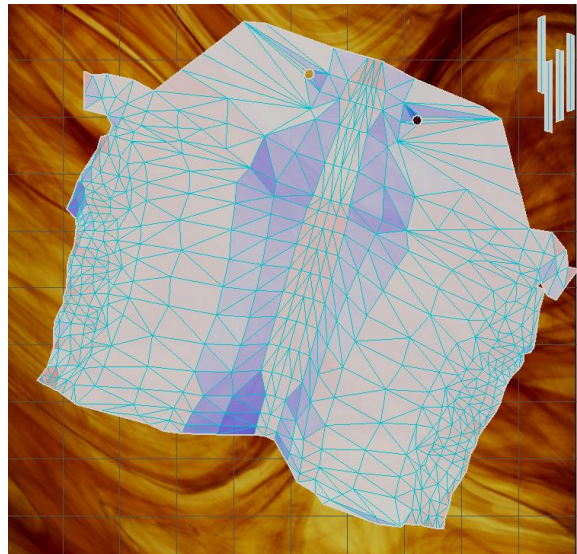

Figure 22: Initial Handle Finish

Figure 21: Handle UV map

Figure 23: Final Render

Figure 24: Initial Render

Model 2: Tile.

Initially I used a brushed metal image and a pre-set brushed metal shader with lowered specular properties. Further to this I added figure 1 as a bump map to increase detailing.

Figure 25: original tile texturing

I decided as the tile would be used as part of the guns stand that I would create a sperate version which could be used as a backdrop to the scene. The tile had to be split into pieces and the extracted pieces where animated.

Figure 27: Animated tile

Model 3: Unicorn:

For the Unicorn model I decided to use a pre-set glass shader giving a delicate effect which also incorporates interesting reflections from the sky-dome and other models.

With some extra time, I decided to animate the unicorn and experiment with building a rig. I have provided 2 animations as I felt the unicorn was still lost occasionally in the dark colours.
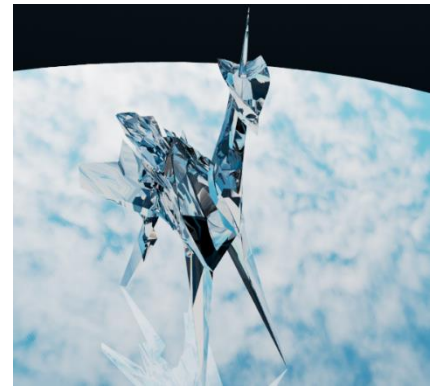

Figure 28: Initial Unicorn Render

Scene and Lighting:

I used an Arnold sky dome which allowed for interesting reflections within the models and decided on using a photo tent HDR map [1], this has many LED lights and a greyish colour to accompany the industrial feel of the models.

I added several area lights to apply colour to the background as well as play with reflections in the turntable and glass unicorn reminiscent of Pink Floyd's 'Dark Side of The Moon' album cover.

I chose to make the turntable appear as a mirror. These mirrored reflections display parts of the model that may not have been seen in the final render and due to my decision to change the sky dome the turntable now appears darker.
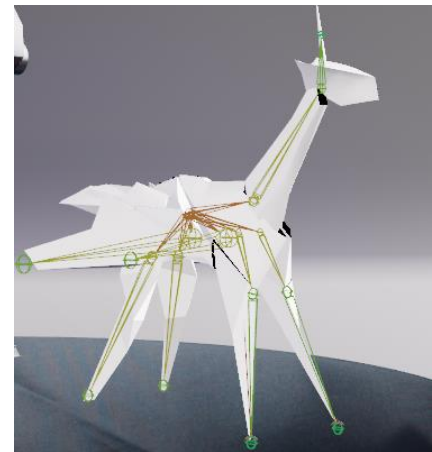

Figure 29: Unicorn Rig

Further to the scene I followed an online tutorial [2] to create a molten metal liquid using Bifrost to accompany the scene in keeping with a futuristic industrial theme.

*Development in lighting (final render, initial render)*

Lessons learnt:

From spending time texturing I have become more competent using the UV editor. I have gained skills in applying texture to a mesh and fixing textures by sewing mesh pieces together in the UV editor. After making many errors with my mesh in the future it will become extremely important to consider proper geometry as this caused considerable problems for me when texturing.

Videos:

The video links (right) show the different detail and development of the scene.

Video 1 was my initial attempt at texturing using only a sky dome for lighting making use of a blue sky and clouds as reflections.
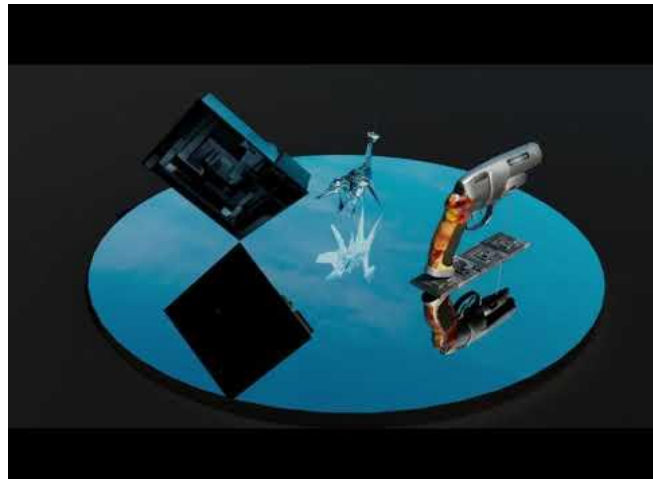
Video 1: 1st attempt at rendering models

Video 2 shows a change in the sky dome using a photo tent [1] as the HDR map, added area lighting to create coloured reflections, fixed models, smoothed turntable, animated tile and Bifrost liquid simulation.

Video 2: Final Render using all models

Video 3 was created to put more focus on the unicorn animation and rigging. This scene has a new ground plane to create a more consistent background and carefully placed area lights to introduce a spectrum of reflections.

Video 3: Unicorn Animation with Bifrost

References:

Textures:

Figure 1:
eestingnef, Adobe Stock, 'Metal floor plate background. Seamless pattern 3D Rendering Illustration' [online] URL: https://stock.adobe.com/

Figure 5:
Budimir, Adobe Stock, 'Steel Plate' [online] URL: https://stock.adobe.com/

Figure 14:
Galyna_p, Adobe Stock, 'Concept geometry pattern with line. Geometric degrade motif for header, poster, background, [online] URL: https://stock.adobe.com/

Figure 17:
Africa Studio, Adobe Stock, 'Polished metal background, close up' [online]
URL: https://stock.adobe.com/

Figure 18:
Roberto Sorin, Adobe Stock, 'Black carbon fibre material texture background. Digital illustration art work' [online] URL: https://stock.adobe.com/

Figure 20:
Kup1984, Adobe Stock, Dark abstract background, vector illustration [online] URL:
https://stock.adobe.com/

Figure 21:
Amanda Aiken, Adobe Stock, 'Amber Glass Swirl' [online] URL: https://stock.adobe.com/

Sky dome:

[1] HDRMAPS, 'PHOTO TENT', [online], hdrmaps.com, URL: https://hdrmaps.com/photo-tent/

Research:

[2] TunnelvizionTV, 2017, 'Maya Tutorial: Bifrost Fluid Simulation Basics', [online], YouTube, URL: https://www.youtube.com/watch?v=56CLpihdLB0