POWER DOWN

By John Irvine

INTRODUCTION

This was a special project as it was my first Maya composition, which was a personal ambition as a Digital Media student. *Power Down* was created for a university assignment as an introduction to 3D modelling. The main focus of the assignment was to compose an environment (preferably dystopian) with a building and broken vehicle based on photographs provided by our lecturer. Me and my colleagues were free to use our artistic licence to create the final composition. It took almost three months to complete the project.

MODELLING

Building

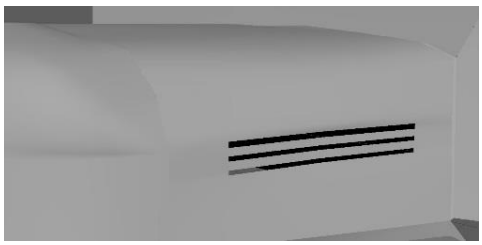
The building would have easily been constructed with such polygon tools as cubes. However it was modelled with a plate tool in reference with the photograph. This was to take the angles of the building into account. Each plane was arranged to fit the X, Y, Z dimensions to construct the full model. Time was spent creating one window before it could be duplicated, even down to the transparent object for the glass behind the pane. Even a broken window pane from the photograph was replicated in the model.

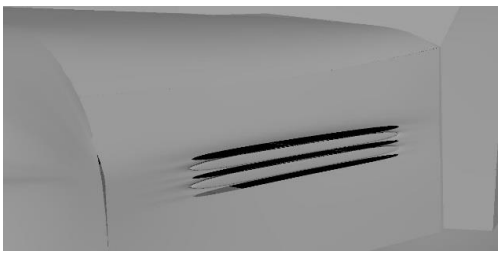
The red lines establish the X, Y and Z angles in the photograph

Truck

Modelling the truck was my first enriching experience in crafting a 3D model with the appropriate Maya tools. It all started with a curve tool, which led to lofting between the edges, extruding from the ends and combining all the vertex points to create different components of the truck. The fender and the mudguard was the first components to be created before one side of the truck was fully modelled. The object was duplicated and combined to give the full model, which was an interesting process than I originally thought. This introduced me to the complexity of modelling on Maya.

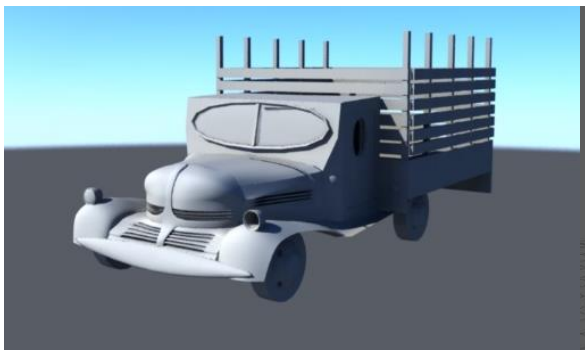
Out of all the components of the truck, the side grills on the engine took the most time and effort. This was accomplished with a reverse extruding tool in the gaps of the engine in order to give more dimension to the grill.



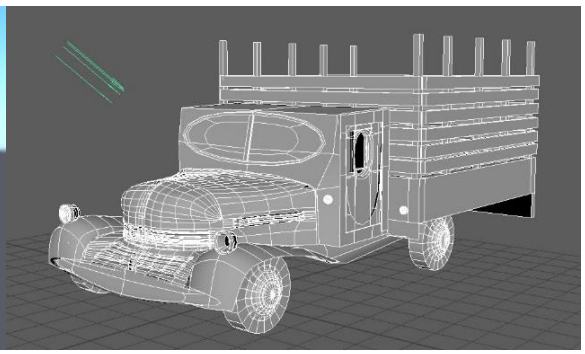


The extrusion tool was applied to give effect to the grill

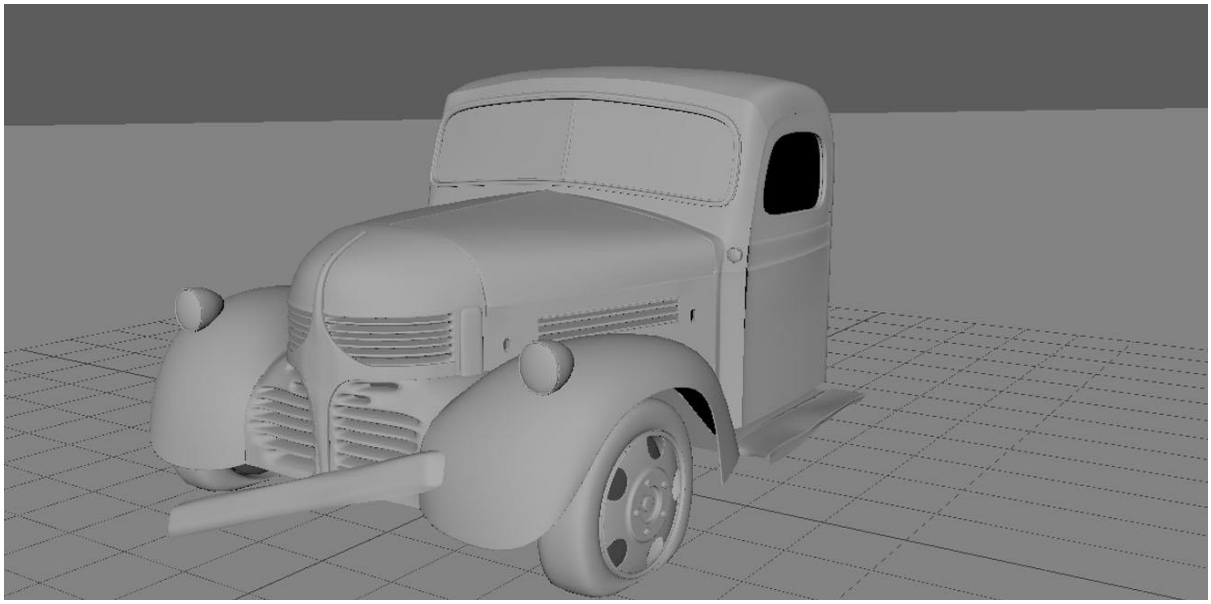
As the truck was the first model I fully constructed from scratch on Maya, completing it was a personal accomplishment. However it was brought to my attention that certain components, such as the cabin, the windscreen and the licence plate, were fundamentally inaccurate in comparison to the photograph. So in order to save time and reference more to the image, the lecturer's truck model was offered to be used. This model had flat tires and a broken license plate, just like the truck in the photograph. It even had a smoother fender, which was not especially smooth in my original model. The trailer was only an optional part of the modelling assignment, so there was no need to include it in the final design



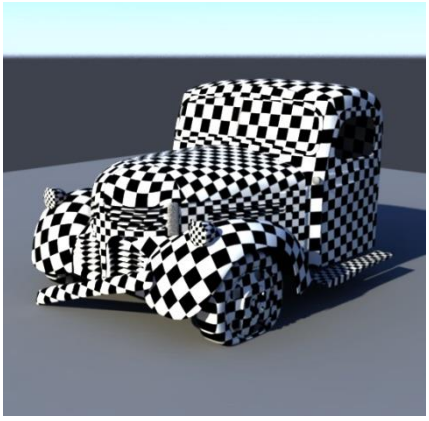
Original truck model



Truck wireframe with sun direction



Gregory's original truck model used to complete the assignment. Copyright © Gregory Leplâtre

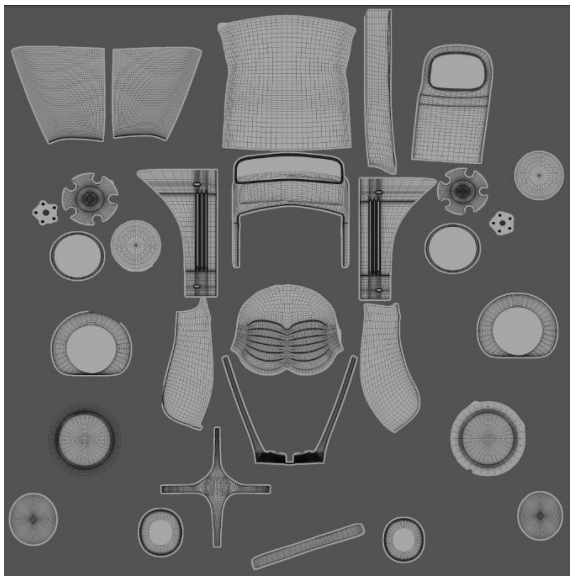


TEXTURING

Before the truck was textured, the model had to be smoothed down and rendered to prevent design complications. The chequered material highlighted the smoothness, so whenever a square was stretched, the pattern had to be adjusted to have all the squares match. This in turn smoothed the object down fittingly.

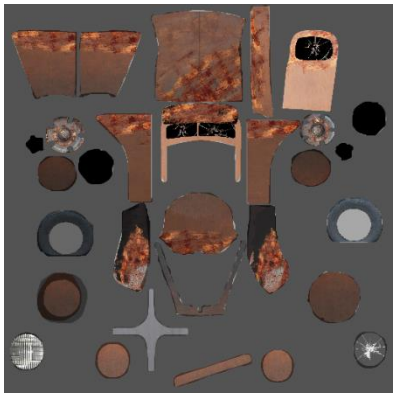
The setting was textured with copyright-free images on Textures.com, even bumped for extra effect. The truck was textured with a UV map, which was constructed with planar mapping. Creating a UV map for each component of the truck was time-consuming, especially with a low-performing laptop. Nevertheless, the map was eventually constructed, ready to be painted over in Photoshop.

Each component of the truck was painted over in the UV map with reference images of different materials, obtained from Textures.com. These images included rusty metal, tires and different headlights. A colour map was created first to colourise the truck. A bump map was created to give each component an original material and detail. This applied majorly to the side step behind the mudguard and the headlamps.



UV map

Finally, detail was applied to certain components with a speculation map, giving the material of each component “shine”. Most of the components were omitted to age the rotting truck. However certain parts were given subtle details, particularly the unbroken headlamp.

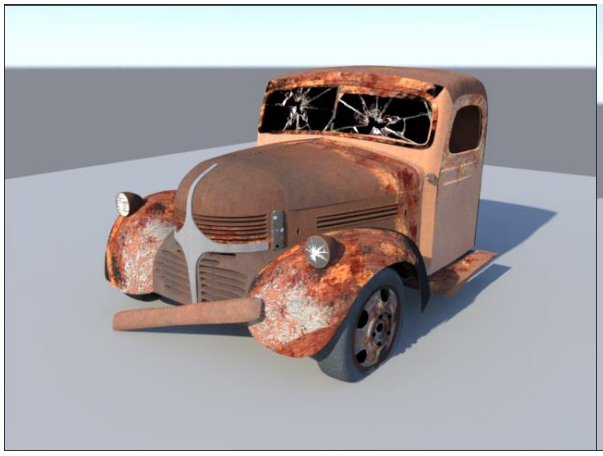


Colour map

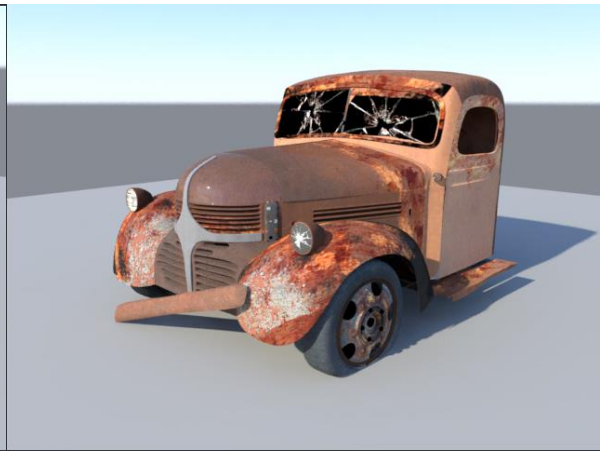
Bump map

Speculation map

Comparing the bumped and speculated images of the truck, some subtle changes to the truck could be noticed, particularly the shine off the fender, the mudguard and the headlamp. The windscreen could have been improved, perhaps with transparency or further dimensions on the bump map.



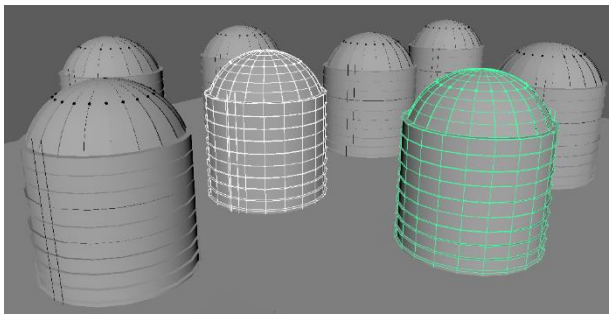
Bumped render image



Speculated render image

CONSTRUCTING THE SETTING

After completing the modelling and texturing of the building and truck, I was free to use my artistic licence for the final composition. For this, I drew inspiration from the oil and gas rigs of Sullom Voe Terminal, close to my hometown in Shetland. Dystopian industrial landscapes are a popular subject for digital artwork, so the building and the oil rigs were textured with rust and rotting paint to establish the mood.



Oil rigs

The oil rigs were created using basic shape tools, such as cylinders and spheres. The sides of the cylinders were extruded outwards to give more detail, which would later generate the full effect of the texture and bump of the rigs.

I saved time by not creating a UV map for the building and the rigs and instead textured and bumped them directly with the material images. This worked out better than I had originally planned, especially for the oil rigs. Since they were in the background of the composition, I decided not to give too much detail to the material so their distance could be verified. The automatic sky and sun settings in the render tool would not have suited the gloomy tone of the composition, so I created a cloudy sky behind the composition with a plane tool.

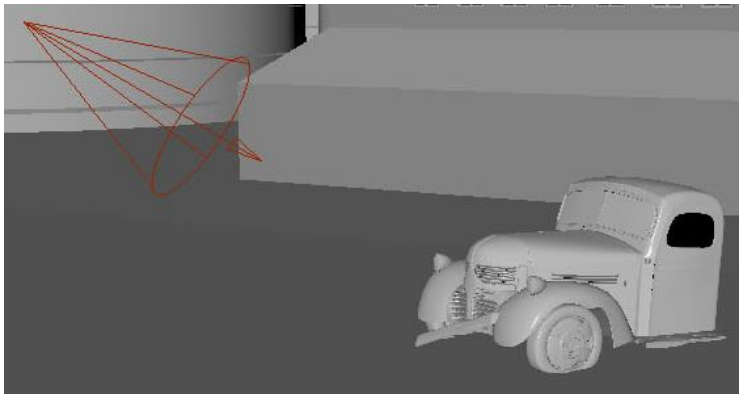
As I spent time on the truck model, I decided to include it in the final set extension. This in turn develops the dystopian environment further by having a sense of abandonment and lack of cultivation.

There were various ideas for the ground, such as grass and stone, and were textured and bumped directly from reference images of each element. But the grass

was omitted after the renders did not flesh the material out on the flat surface. However the stone material was rendered with strong detail, so I decided to use it for part of the ground. The pebble road surrounding the buildings also gave detail in the renders, so combining the two developed the setting.

LIGHTING

Establishing light into the composition was the final touch to give effect to the setting. The process was not as time-consuming, as the natural ambiance provided by the sunlight formed the shadows appropriately. Though personally, I felt that more shadows could have been applied to the building. However, it could be argued that the building was more in front of the oil rigs and therefore was hit more by the sun.



Spotlight on truck; highlight back of building

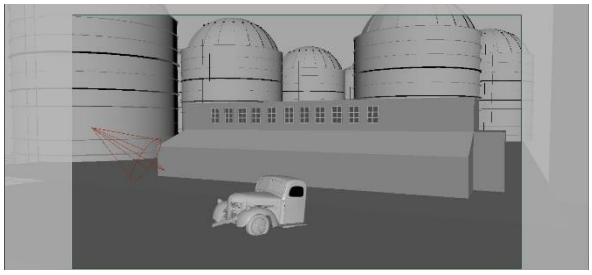
The windows were not given any lighting effects, such as shadows, in order to establish the deteriorating material.

The truck, which was placed in front of the building, was spotlighted to establish its arrangement in the composition.

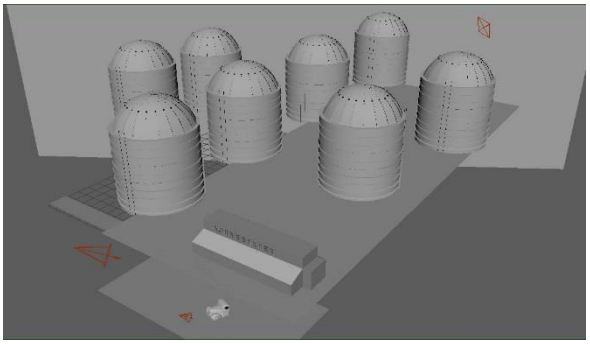
CONCLUSION

As this was my first project created in Maya, I am especially proud of the work I put in. I truly believe that I learned the basics of modelling, texturing and lighting techniques in Maya, which was the purpose of the module. However, looking back on the project, I would have improved the lighting of the composition further, particularly to manipulate the shadows and shade the building to blend it more into the setting.

In terms of modelling and even texturing, this project was an achievement on my practical abilities on Maya. Though I would like to develop my understanding of the texturing process as I felt that certain materials, i.e. grass, could have easily been used in the composition. But overall, *Power Down* is my first 3D composition and will always be highly regarded for future projects.



3D model of composition, as seen in final render



Full 3D model of set extension

Power Down, John Irvine (2016)