

## 15 November 2018

This resulted me to prefer starting with individual items rather than constructing the whole space. Once I knew how big the tables, seatings and pillars are, I was then able to get an approximate size of the room. I used cubes to first identify what are the relative position of the bigger things would be in to shape the room.



Fig 4, 5, 6 Sketches with numbers and photos of table and chair

Fig.7 floorplan in Maya

The image shown below is the view that I chose to render in the end. The left hand side of the cafe, which consists of a counter and a fridge, was not focused in this task, and as it is not permitted to go behind and take better look at the objects, I decided to only reconstruct a general outline of the fridge and the counter.



Fig.8 Render view in real life

### {Techniques and surfaces}

#### ❖ Extrude

This technique is used quite a lot, when forming all the parts into one whole object is preferred. For example, I would like to make the counter appear like there are many different cabinet door or drawer without having to manipulate many different cubes. I extruded one small surface, push it back and resize it, then it would seem to have a gap in between. In another example shown below, it is also the quickest way to give the coffee cup a thickness.

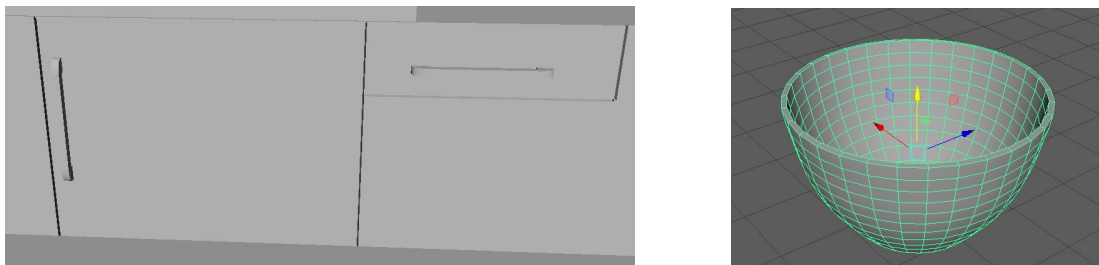


Fig. 9, 10 Examples of Extrude

#### ❖ Duplicate

Duplication is massively utilised when I reconstructed the whole cafe. This eliminates the time of having to import the object every time. Also, as this technique produces an exact copy of the item at the exact same location, once the imported one is located on the correct height, such as on the floor or against the ceiling, it will very quick to have a straight line of the same object on the same horizon. This reduces the chance of the chair floating in the air.

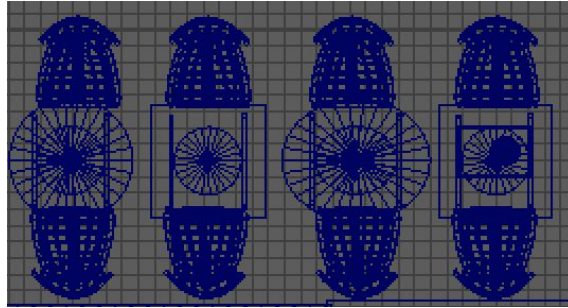


Fig. 11 Example of Duplicate

#### ❖ Create Curve

Curves are generally created when constructing the back of the chair, so that it can have the smoothness of the curve, unlike moving the vertices around. Lofts can be created with curves, however the surfaces are relatively complicated to handle, so was not used in any finalized model,

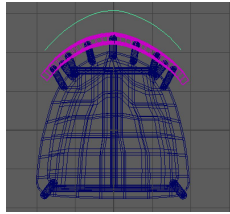


Fig. 12 Example of Duplicate

#### ❖ Revolve

It is adopted when creating an object that has the same edges 360 degrees, in my case, the coffee cup.



Fig. 13 Example of Revolve

#### ❖ Bevel

This is used on the edges of an object. Most of the existing things do not have sharp edges, so often bevelling the edges is required, like the handrail of the staircase as shown below. In this assignment, bevelled edges are mostly found in chairs and sofas, due to the softness.

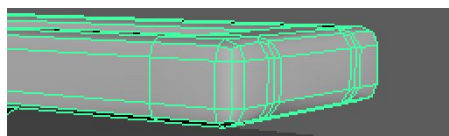


Fig. 14 Example of Bevel

#### ❖ Bend handler

I was not able to reconstruct the back of the chair simply by creating a curve and extrude. This gives a symmetric bend for the chair.

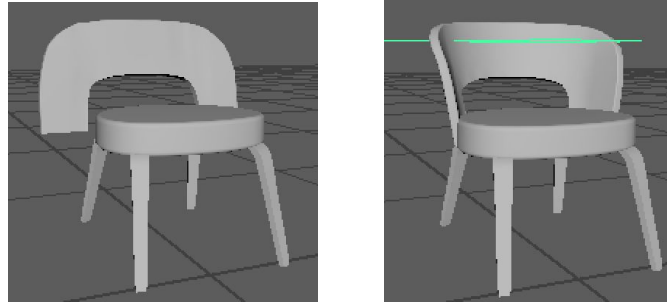


Fig. 14,15 Before and After Bend

#### ❖ Mirror

I tried out this technique when attempting to make the complicated pattern on the back of the sofa. It duplicates the geometry of the object and attach to the original. When mirroring several times, I would get an integrated of repeated pattern like the image shown below.

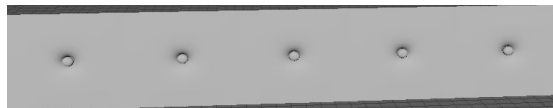


Fig. 16 Example of Mirror

#### ❖ Insert loop

Most of the time, I use this when I want to only extrude a part of the polygon, like a raised barrier on the counter, or half part of the ceiling. Sometimes, it is used so I can bevel an edge.

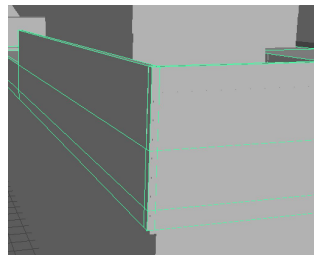


Fig. 16 Example of Insert Loop

#### ❖ Poke

The screenshot shown below is the view of an air conditioner on the left hand side attempted to be reconstructed. It gives the object triangular faces which is what is need for the middle part of the AC.



Fig. 17 AC

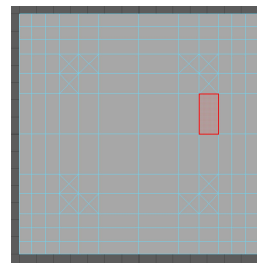


Fig. 18 Example of Poke



#### ❖ Smooth proxy

This method allows the sofa to look softer than the bevel does, mostly on the holes and the lines around them.

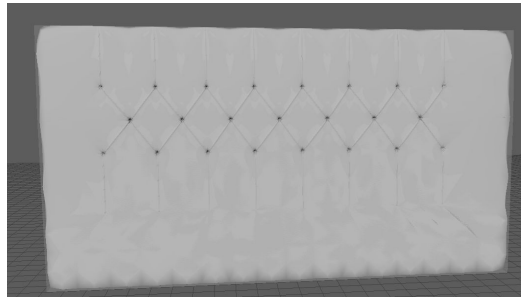


Fig. 19 Example of Smooth Proxy

#### ❖ Wedge

The handrail, the support of it, and the handles on doors would have a sudden bend. They can be easily modelled by adjusting the angle, where the greater the sharper the bend is, and the divisions, where more means a smoother transition.

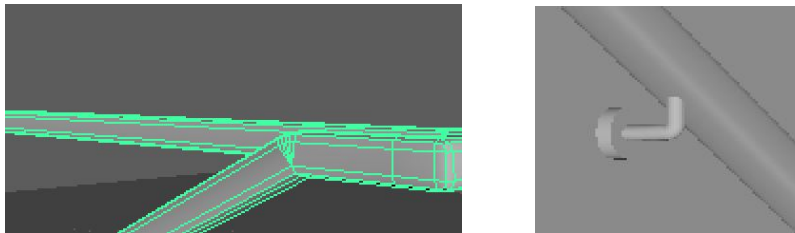


Fig. 20 Examples of Wedge

#### ❖ Bridge

This is a useful linking two surfaces. In the image shown below, the two extruded faces are connected creating a cup handle, which saves the time of create a separate handle and connecting it to the cup. I did try creating a separate handle and merge the vertices of both objects, however, it does not produce as similar looking to the real cup as bridge would provide.

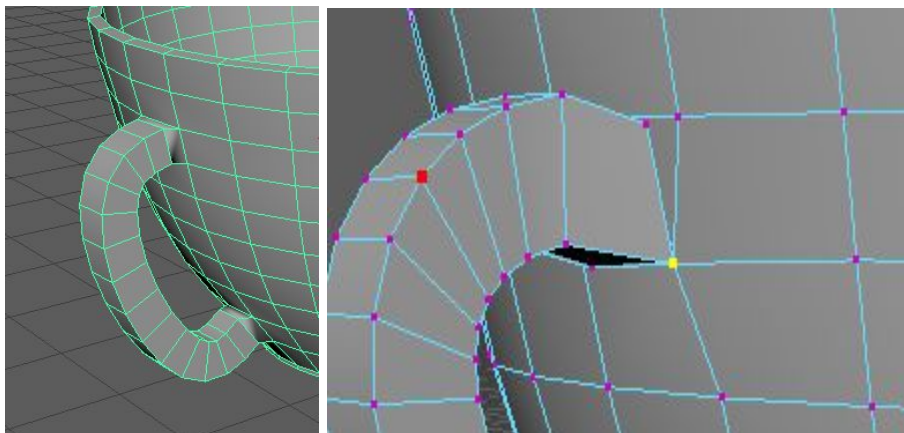


Fig. 21 Example of Bridge

Fig. 22 Example of Merge

#### ❖ Boolean - Difference

This is normally implemented when a hole or an indent is need on an object. The screenshot shows a wall that has squared glasses being constructed. In this case, I did not add any planes to act as glasses, so it can

be seen through. Another one is the counter with several indents for putting food in, which is created by having several cubes intersecting each other.

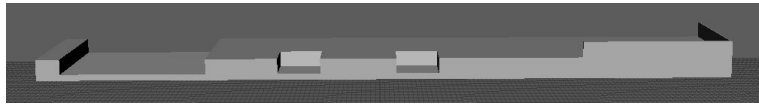
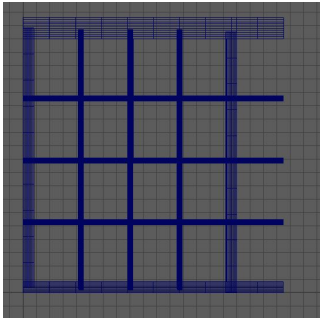


Fig. 23, 24 Examples of Difference

### {Process and Discussion}

There are other techniques, such as combine and group, which does not perform modification to the shape or size of the polygons. However, they are efficient ways to manage a group of components of an object. It usually keeps everything together in their relative position when try to translate the components, unlike when doing it separately.

A quick way to deal with polygons that are supposed to be an enclosed object but are not is to use Fill Hole. It is efficient comparing to extruding from an edge and merge it, and for most of the time, I can be certain that the polygons are enclosed.

To elaborate on the benefit of duplicate, I saved time and got better result. At first when building the chair legs, I reshaped and rescaled each leg one by one, however, it resulted in inconsistency. Therefore, after shaping just one leg into its form, I then duplicate it, only by changing the angles, I was able to get four identical chair legs in a much faster time.

Other than the techniques mentioned, manipulating vertices, edges and faces can also reshape the polygons, and sometimes it is easier to manage. For example, by moving vertices of a cylinder, I acquire an ellipse-shaped table top; and of a cube, I get a curved chair leg. Sometimes, it gives the flexibility to make minor changes for a better shape, but it can also result in an edge that is less smooth. Since there are a few of irregular edges for me to reconstruct, I did perform this quite often.

For example when modelling the coffee cup, I firstly attempted to use curve and revolve that results in a perfect smooth cup shape, however, in order to perform other actions onto it, I will have to convert NURBS into polygons. This then resulted the surface to be divided into much smaller and triangular faces like shown below, which for me can be confusing to manipulate. As a result, I decided to reshape a cylinder by rescaling the vertices. With more divisions in height, I also got a fairly smooth cup shape as my result.

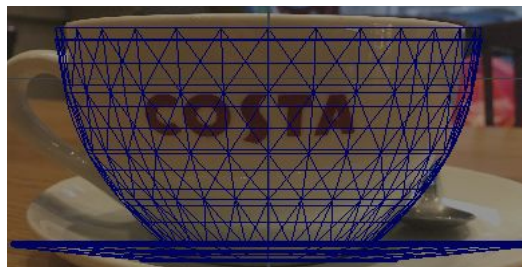


Fig. 25 NURBS into Polygon

Overall, in my opinion, I chose a relatively large space with many types of chairs. I would say that the modelling the chairs and the sofas consumed a lot of time. A lot of different methods had to be tested out in order to be able to get the ideal look of many different objects, even though sometimes it might not look perfect, or simply not able to proceed into forming the correct shape. In order to create the pattern of it, I tried using a plane with chamfered vertices and then merged onto a cube, but the result after smoothing does not have the shape of a sofa. The current method I took was to create poke faces and bevel some edges that ended up with a small hole with lines that look similar to the folds of the cloth, which I believed it to be a more optimal solution.

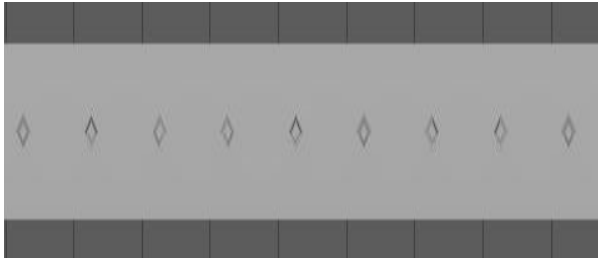


Fig.26 Attempt on using plane and chamfered vertices

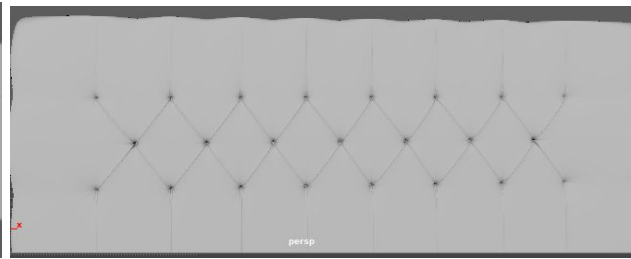


Fig.27 Final result of the sofa

As for improving the smoothness of my curves, I should import all the images of the chairs and produce curves of the back according to the images rather than eyeballing. The coffee cup, which was done with the help of the image, seemed to be very successful along with the saucer.