Interior modelling of Beerd bar in Bristol

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***Abstract*—This report is a description of the process and understanding of 3D geometry modelling of the Beerd Bar in Bristol, UK, using Autodesk Maya, for the Character and Set Design coursework.**

I. Preproduction and Planning

PREPARATION at the start of the project was essential in order to correctly capture the scale of the space. At first, I visited the bar and asked for the permission of the manager to take pictures and measurements. I sketched the outline of the space, with the aid of a meter to take measurements of the key objects in the scene such as, window lengths and small table, small chair, and the big table width, length and height. The sketch is show in **Figures 1, 2, 3 and 4**. Also taking some photographs helped visualize the area better when working on the model, some photographs are show in **Figures 5 and 6**. While I was working on the model the bar was had a small reconstruction on the interior space that I was working on so some of the furniture where not included in the model.

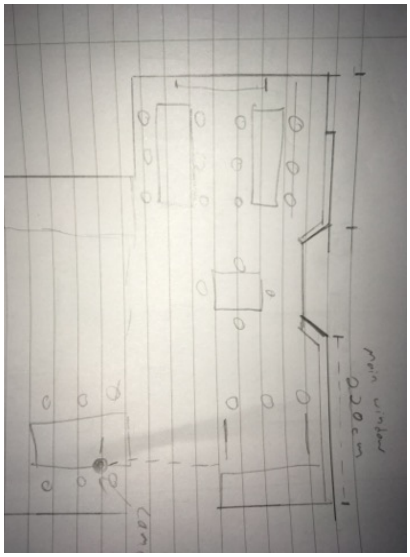

Fig. 1. First sketch of blueprint, top down view of the area.

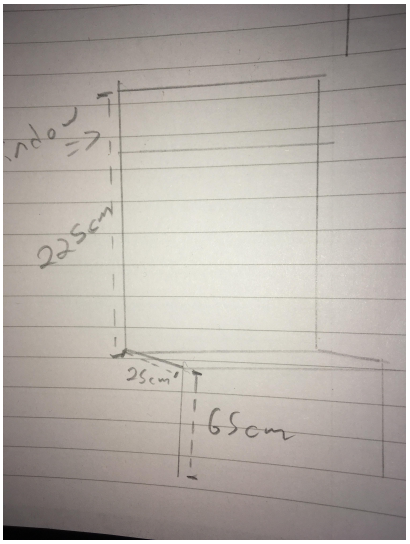

Fig. 2. Detailed measurements of window and lower wall.

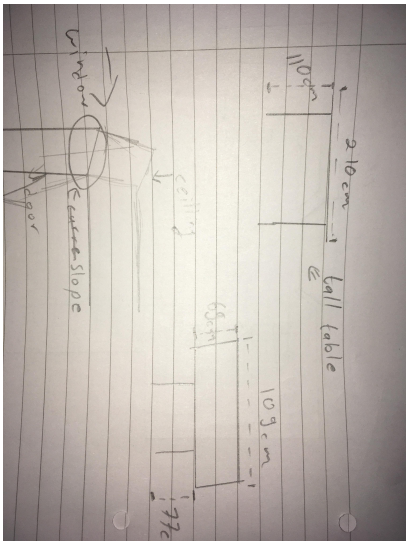

Fig. 3. Measurements for different tables.

II. Modelling Techniques

A. Box modelling

This technique was used for the most basic shapes found in the scene, such as the walls, the windows and the top of the tables. It was also used to setup a basic prototype for some of the more complex objects such as doors, or some of the table legs.

B. Curves

Curves were mainly used in flowing shapes and highly detailed curving shapes in the scene, the best example of this is the logs of the chair show in **Figure 7** and in the chair's seat since the irregularity of that shape could be captured best by the use of curves. Another great example of this is in the lights inside the "PIZZA" writing on the wall **Figure 8** . Generating curves from the type tool, and extruding a circle along those curves allowed me to create the small lights in the shape of letters.

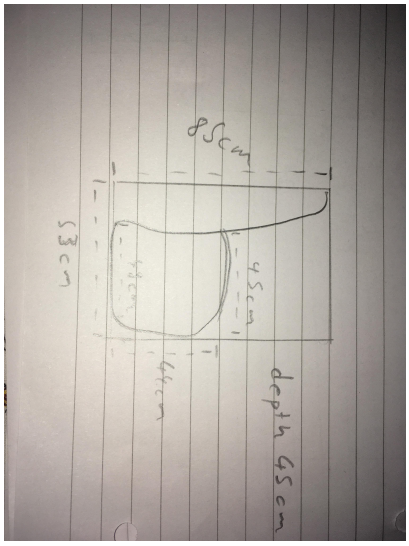

Fig. 4. Measurements for the curved chair.

Fig. 5. Photograph before reconstruction

Fig. 6. Photograph of the space after some reconstruction took place

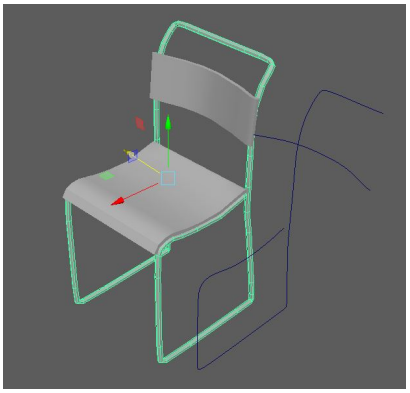

Fig. 7. Small chair with curves used for to create it.

C. Loft

The Loft tool was used in the creation of the more detailed table legs and chair legs in the middle of the scene since **Figure 9**. Starting of with a circle, duplicating it and scaling it in order to create the desired outline, then using loft to create the desired shape.

D. Beveling

Beveling was applied to everything, but it was also used to achieve some small curved sections, or smooth out some of the hard edges of some of the objects **Figure 10**. Beveling was used carefully by selecting specific edges and applying a bevel only to them. For example objects have bevel effects applied differently to each edge where necessary to get the form of the object correct and realistic.

E. Mulitcut tool and Component manipulation

This technique was also applied to every object in the scene, it was used for simple reasons such as to scale objects to the appropriate dimensions or even get some irregular shapes, but also to merge vertices and manipulate polygons in order to create a detailed representation **Figure 11**. Multicut tool was used in conjunction with this to add edge loops or create extra vertices necessary to manipulate the objects and add further details.

III. Process

At the start of the project my though process was that I need a way to keep track of the scale of the interior, therefore I created the objects that would help me keep track of the scale of each additional object I create. This objects were the ones that I measured exactly since it would be the most accurate scale i could get at the start. Therefore I started creating the windows, the the adjacent walls. This provided a basic visualization of the area as shown in **Figure 12**.

Moving forwards the next step were to start creating chairs, tables and couches. Using my measurements again for the tall table and the short table (**Figure 13**), I started creating them. the tall table was an easy task to create since it was composed of simple shapes such as cylinders and rectangles. Arranging them and scaling some parts would result in the model of the tall table. Taking this a step further I also used some beveling in order to remove the hard edges of the table top and improving the realism. The same process was used for the small table as well with an added use of Boolean difference to create the middle area.

The first set of chairs that I made were the ones show in **Figure 7** and since the design of the chair had many flowing curved lines inside I decide it was better to start using the curve tool. In order to maintain the scale of

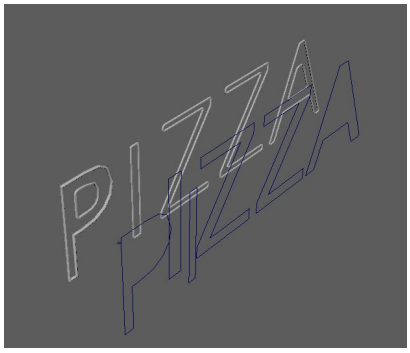

Fig. 8. Neon lamps for ”PIZZA” sign on the wall.

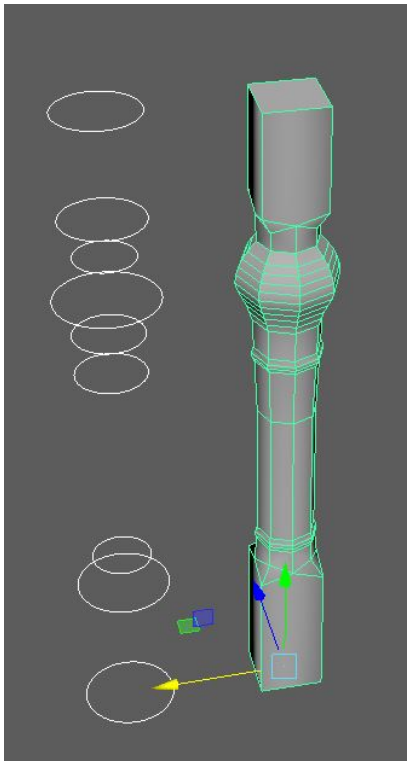

Fig. 9. Small detailed table leg and the circles used for its creation.

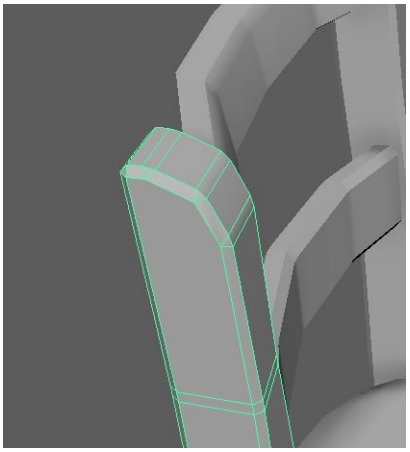

Fig. 10. Tall chair showing different beveling applied to different edges to shape the geometry.

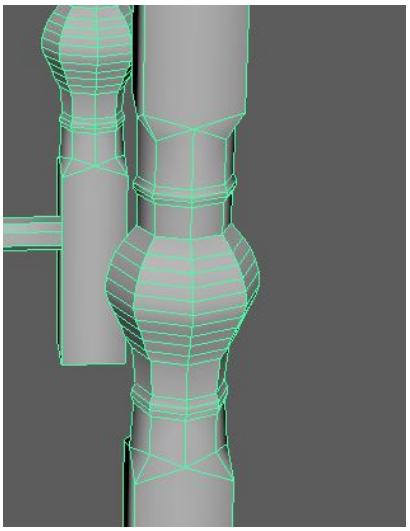

Fig. 11. Transition between cylinder to cube using multicut and component manipulation.

the chair, since I had the measurements for that specific chair, I made a cube and mad it a template, allowing me to visualize an outline dictating the borders of the chair. Both the legs and the seat of the chair were created using curves. At the end I had to extend the chair's leg's using its vertices in order to get the chair to the correct height.

The second set of chairs that I modelled were the tall chairs **Figure 14**. This was a bit more challenging since there were some curved surfaces that I could model using curves but after some failed attempts I decided to start with some rectangles and add edge loops. Using this method sped up my modelling process. There was a simple symmetry between the snapped edge loops that I could work with in side view and give me the desired curve effect, in much more detail that I was getting just by using curves. Also making the seat of the chair this time since it is a pillow like surface seemed like a small challenge, but using some face extrude and edge bevel made the geometry smooth and similar to the seat. After this I continued using the process of manipulating vertices, edges and faces more frequently throughout my project.

The last set of chairs and the table in the middle were the most challenging of the three, the legs had more detail than the rest (**Figure 15**). At first I used squares and circles to create an outline of the leg but after trying to use loft, it wouldn't allow me to create a loft between a circle and a square, so I decided to make the outline of the leg using all circles (**Figure 9**). At some point on the leg there was a transition from a cylinder to a rectangle, therefore to achieve that effect I used a loft on the circles with a section span of 8, this would allow me then to delete every other edge to create a rectangle structure and then merge some vertices to create the transition effect. Afterwards I added some extra edge loops to create some border details and

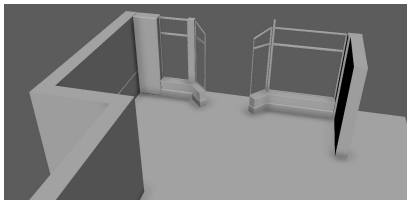

Fig. 12. Starting steps for the model, to help visualise the scale.

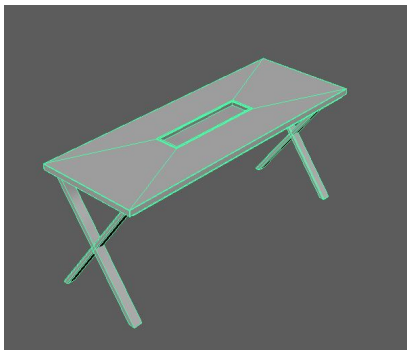

Fig. 13. Simple table made with extrude techniques.

finally used beveling by first selecting the edges that I wanted to smooth a bit more to create a higher resolution model, and then used bevel to the rest to create a more realistic view of the wood leg. This same leg was used for the chair leg but with some modification on the vertices and edges, that would match the table leg to the actual chair leg. The back of the chair together with the seat were simple shapes with some component manipulation with the multicut tool to create a curved, realistic wooden structure for the chair.

At this point two major things for the scene, the doors and the ”PIZZA” lamp on the wall (**Figure 16**). Creating the doors was simple using rectangles for the frame and a rectangle with some extrude on for the windows and the details and some basic shapes for the door handle. The writting on the wall was trickier since it was like a Neon light sign. I created some text using Maya type create tool, and after setting the text to the correct size, I extruded the front face and then pushed it back in to create the lamp's outline. Then using the same letters, there was an option to create curves from the letters, so using the generated curves, I tried extruding a circle around the curves **Figure 8**. The generated geometry was not created evenly and had uneven twists and curves and did not produce the intended effect. Therefore to make the rest of the letter lamps, simple cylinders, with extrusion methods and simple curves were used in place of the generated curves from the type tool.

To finalize the model of the interior, there were many details needed to give more life to the model. The lamp fixtures hanging from the ceiling and the ones attached to the wall were created by simple shapes and manipulating the edges and vertices of the shapes to match the shapes of the original. Also salt, pepper and the cutlery holder were simple cylinders with added edges and the appropriate manipulation of them.

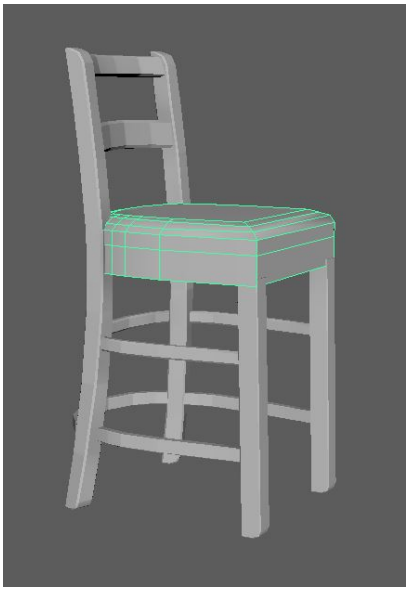

Fig. 14. Tall chair, the first experience with more details manipulation of vertices and edges.

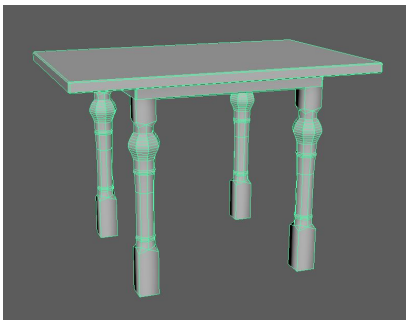

Fig. 15. Small detailed table.

The cutlery inside the holder were made as low resolution as possible by just creating a basic shape and the tissues were a result of the difference between two cylinders. Adding these details shown in **Figures 17, 18, 19, 20** to the scene together with some other such as the exit sign, fire button, light switch and air conditioning unit made a big difference to the looks of the render.

IV. Conclusion

The project has taught me many ways to manipulate objects from using simple extrude methods, to incorporating curves for more natural shaped objects, to even add detail and manipulate vertices of objects that need an extra touch of detail. Throughout the whole project I didn't use NURBS, after trying it a couple of times, I was always generating polygons since manipulating vertices gave me more control over the shape of the object. One thing I would do different would be to prepare more at the start. After my initial visit to the bar, my measurements and photographs were not helpful enough so I had to visit many times afterwards to get more measurements and understand the structure of the interior.

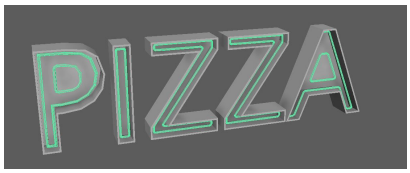

Fig. 16. ”PIZZA” wall sign.

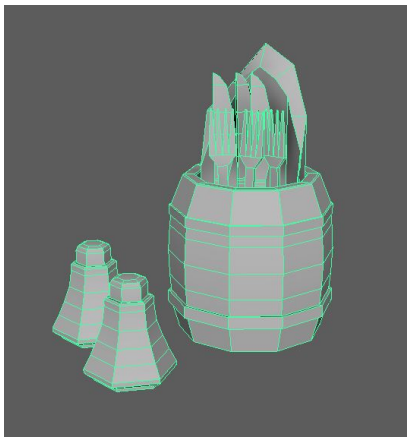

Fig. 17. Table details, salt, pepper, cuttlery with holder.

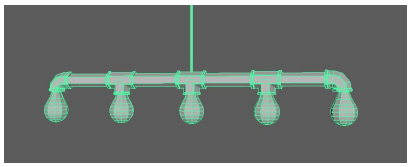

Fig. 18. Lamp fixture 1.

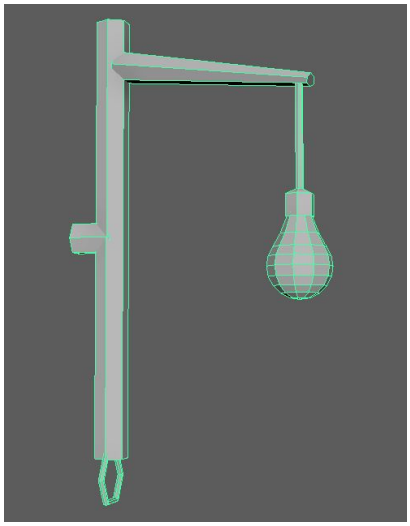

Fig. 19. Lamp fixture 2.

Fig. 20. Lamp fixture 3.