Assignment 3 File submitted for

UCS-632: 3D Modelling

By

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CLASS GROUP: COE-4

SUBMITTED TO

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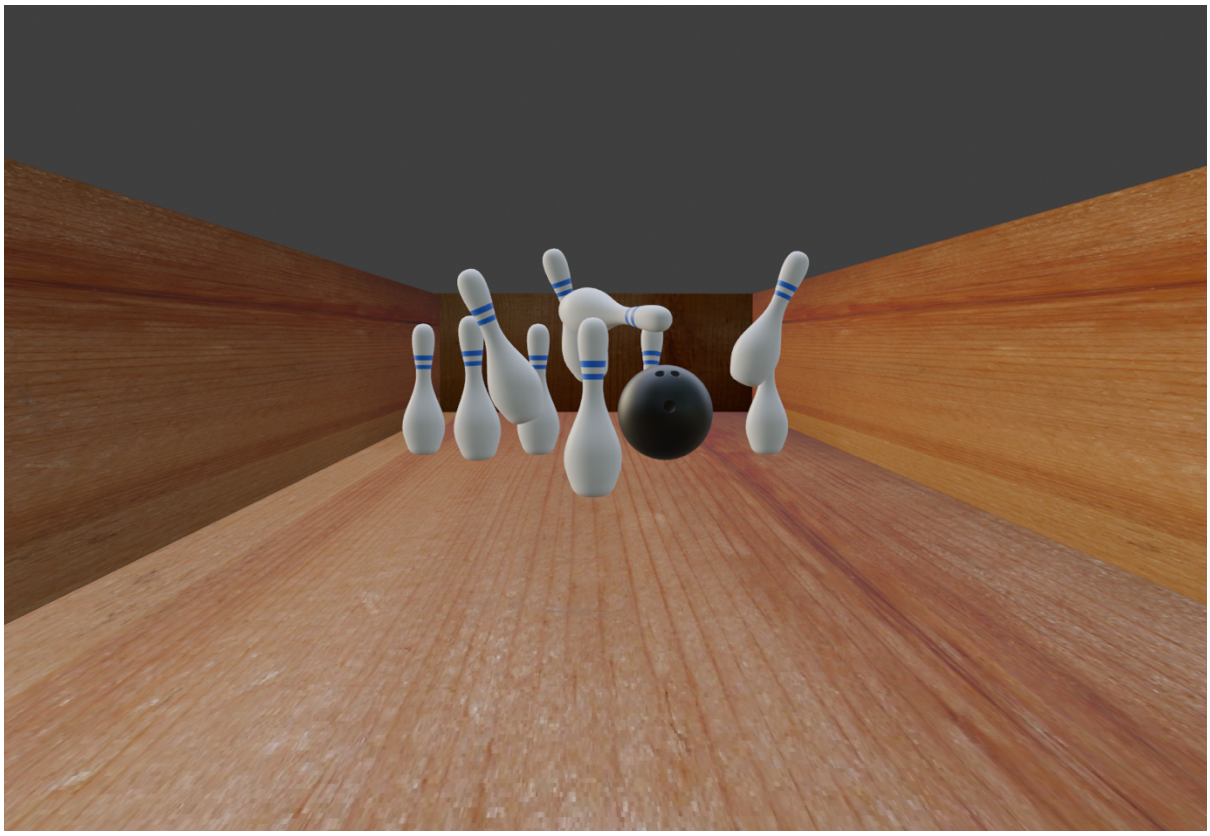
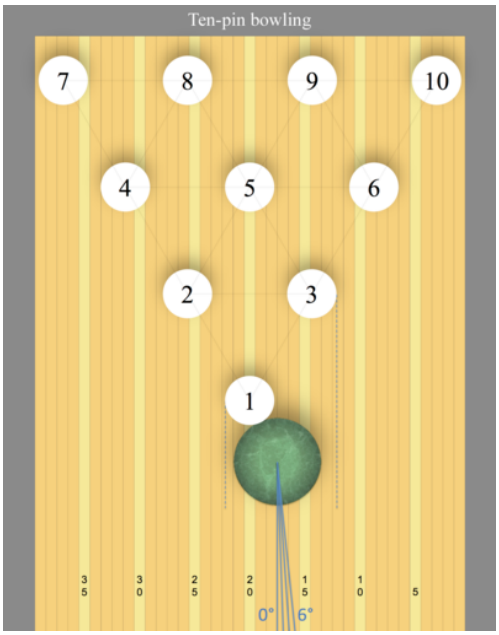
Blender 3-D Model: Bowling Ball and Pins in Blender



Objective- To design a bowling pin and ball configuration scene in Blender and export the scene in Unity.

Software Required- Blender v2.8, Unity 2018.4.15

Research Work-



Bowling Pin-

A bowling pin in itself follows United States Bowling Congress (USBC) specification. The pin is 121 mm wide and 380 mm tall. The same specifications have been kept in mind while designing the pin. The standard configuration is the 10 pin specification. The bowling pin rack is as follows-

1. Each pin is 304.8 mm from its adjacent neighbour.
2. Any pin directly behind the other is 527.05 mm away from the other. This includes number 2 and 8 pin, 3 and 9 pin, and 1 and 5 pin.
3. Each side of the deck's perimeter is 914.44 mm away.

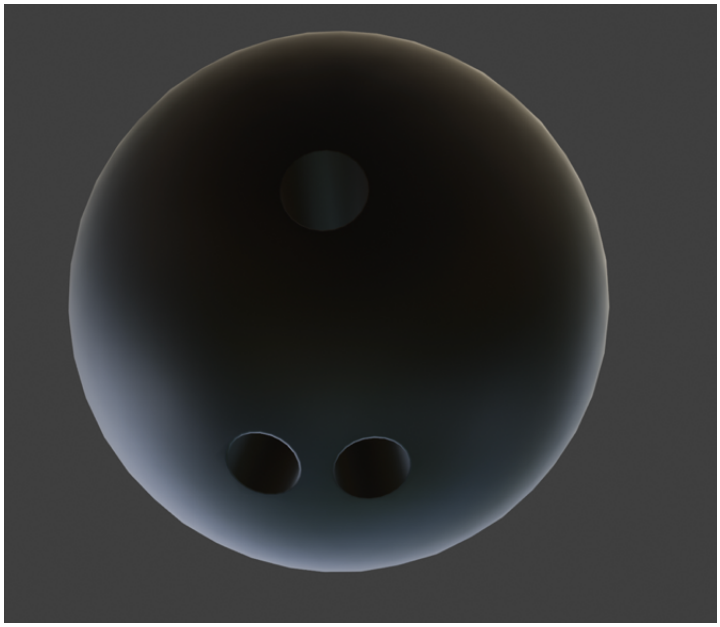
Bowling Ball-

It is a hard spherical ball used to knock down the bowling pins in the alley. It usually has two holes for fingers and a other hole for thumb forming a triangle. The USBC states that a bowling ball must have a diameter between the range of 215.9 mm to 218.3 mm. Hence, the same measurements have been kept in mind while designing the ball.

Design in Blender-

Steps-

1. Remove the default cube by pressing Shift+X.
2. Create a new sphere by pressing shift+a and going into icosphere ball section.
3. Add atleast 4 subdivisions for better structure compositon.
4. Use Shade Smooth feature for smoother structure.
5. Going into edit mode, select 6 vertices which are not connected in a pentagon and only in hexagon.
6. Subdivide those 6 vertices to make 12 total vertices.
7. Select convert to sphere option with intensity at maximum 1.
8. Inset the resulting circle twice.
9. Extrude the circle to a desired hole length to create a thumb hole.
10. Repeat steps from 5-9 to create two additional holes at perpendicularly opposite directions to create a total of 3 holes.
11. Go into object mode. Select Material Properties and add a new material to apply over the sphere.
12. Select appropriate colour and metallic property for the ball and save the file.



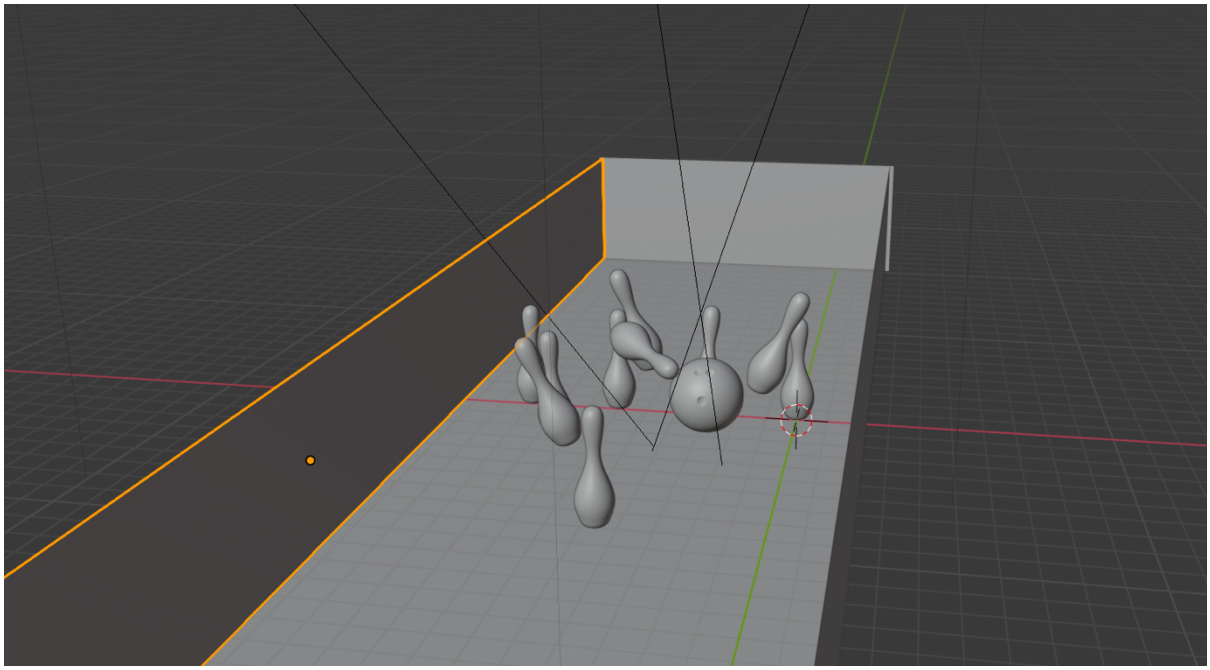
Bowling Ball

Bowling Pin-

Steps-

1. Remove the default cube by pressing Shift+X.
2. Create a new cube at the origin position of radius ratio 2.
3. Add a background reference image of the pin in the X-Z plane with orthographic viewing only.
4. Select Bezier Curve option and make a layout of the pin by going from topmost pixel to the bottom most while having up to 4 points. Make only half the shape.
5. Select the convert to mesh option to convert it into an editable mesh.
6. Delete the original curve.
7. Select all the points in Edit Mode and click on Spin option. Select 24 steps and angle of 360 degrees with center at (0,0,0).
8. In the material section, add white or any other coloured material to the whole pin.
9. Select two regions for blue material in edit mode and apply the material.

Bowling Pin



Bowling Alley

Exporting in Unity-

1. Many exporting options available in Blender.
2. .fbx is the slowest format and takes a huge overhead on performance.
3. Append option used here for linking. It automatically dynamically changes the objects in Unity as they are changed in Blender.