Final Year B. Tech. CSE Augmented Reality and Virtual Reality

# Assignment No. 2

**Submitted by:**

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| **Name of 3D Object assigned** |  |

**Title: Design 3D Objects in Augmented Reality and Virtual Reality Software**

**Aim**

To understand the steps involved in designing 3D objects in Augmented Reality (AR) and Virtual Reality (VR) software.

**Theory**

**Introduction to Blender**

Blender is a free and open-source software used for creating 3D models, animations, visual effects, and even games. It's a powerful tool widely used by designers and developers in industries like gaming, films, and AR/VR.

**Key Features of Blender**

* **User Interface**: Customizable and flexible to suit beginners and professionals alike.
* **3D Modeling Tools**: Includes options for sculpting, texturing, and shading.
* **Animation Features**: Create smooth movements for objects and characters.
* **Rendering**: Generate high-quality images and videos.
* **Cross-Platform**: Available for Windows, macOS, and Linux.
* **Add-ons and Plugins**: Extend its capabilities with a variety of plugins.

**Object Mode and Edit Mode**

* **Object Mode**: Used to manipulate whole objects, such as moving, scaling, or rotating them in the 3D space.
* **Edit Mode**: Allows you to make detailed changes to the geometry of the object, like modifying its vertices, edges, or faces.

**Important Steps to Create a 3D Object**

1. **Start a New Project**: Open Blender and begin with the default cube or import a new base model.
2. **Switch Modes**: Use Object Mode to position your object and Edit Mode to customize its shape.
3. **Modeling the Object**:
   * Use tools like **extrude** (to pull shapes out) and **loop cuts** (to add details).
   * Modify the size, shape, and position of different parts of the object.
4. **Texturing and Shading**: Apply colors and materials to make the object look realistic.
5. **Lighting**: Add light sources to highlight the object properly.
6. **Rendering**: Generate final images or animations of your 3D object.

**Screenshots of Final 3D Object Created**

* Add 3–4 images of the object from different angles, such as front view, side view, and top view.

**Conclusion**

Thus, we have understood the steps for designing 3D objects in Augmented Reality and Virtual Reality software.

**FAQs**

1. **What is Blender?**  
   Blender is free software for creating 3D models, animations, and visual effects.
2. **What are other tools for creating 3D objects?**  
   Some alternatives to Blender are Autodesk Maya, 3ds Max, SketchUp, and Cinema 4D.
3. **What is translation, scaling, and rotation?**

* **Translation**: Moving an object in 3D space.
* **Scaling**: Changing the size of an object.
* **Rotation**: Turning an object around an axis.

1. **What is occlusion?**  
   Occlusion refers to how objects block or hide parts of other objects in a scene, helping create depth and realism.