**Report**

Here are some current and future graphics techniques employed in VR rendering:

1. **Real-Time Ray Tracing**:
   * Ray tracing simulates the behaviour of light rays as they interact with surfaces in a scene. It produces highly realistic lighting, reflections, and shadows.
   * In VR, real-time ray tracing enhances visual fidelity by accurately modelling light paths, resulting in more convincing environments.
2. **Foveated Rendering**:
   * Foveated rendering optimizes performance by allocating more rendering resources to the central region of the user’s field of view (where the eye’s focus is) and reducing detail in peripheral areas.
   * Eye-tracking technology identifies the user’s gaze, allowing for efficient rendering and improved frame rates.
3. **Variable Rate Shading (VRS)**:
   * VRS adjusts the shading rate dynamically based on the importance of each pixel. High-detail regions receive more shading samples, while less critical areas get fewer.
   * This technique improves performance without compromising visual quality.
4. **Depth of Field (DoF) Simulation**:
   * DoF blurs objects outside the focal plane, mimicking the way our eyes focus on specific distances.
   * In VR, accurate DoF enhances realism and immersion, especially in close-up interactions.
5. **Dynamic Resolution Scaling**:
   * VR headsets often struggle with rendering demanding scenes at a consistent frame rate.
   * Dynamic resolution scaling adjusts the rendering resolution on the fly, maintaining performance while preserving visual quality.
6. **Global Illumination (GI)**:
   * GI algorithms simulate indirect lighting, bouncing light rays off surfaces to illuminate the scene.
   * Realistic GI enhances VR environments, making them feel more natural and cohesive.
7. **Temporal Anti-Aliasing (TAA)**:
   * TAA reduces jagged edges (aliasing) by analysing previous frames and applying anti-aliasing techniques.
   * High-quality TAA ensures smooth visuals in VR experiences.
8. **Volumetric Rendering**:
   * Volumetric rendering handles fog, smoke, and other atmospheric effects.
   * In VR, volumetric rendering adds depth and realism to scenes, especially in outdoor environments.
9. **Texture Streaming and Virtual Textures**:
   * VR environments often require large textures, which can strain memory and storage.
   * Texture streaming dynamically loads and unloads textures based on the user’s viewpoint, optimizing resource usage.
10. **Machine Learning-Based Upscaling**:
    * AI-driven upscaling techniques enhance lower-resolution textures, making them appear sharper.
    * Future VR systems may leverage machine learning to improve image quality in real time.

**Reflection**

This week is about lights and sound. Our task is to create a good sound and lights environments. As we have different types of lightings like point light, spotlight, area light, and directional light. It’s very easy to use them accordingly. But while using Area light I faced little bit trouble as it didn’t emit as expected. So, I changed some settings and I got the result. Learnt some new methods this week.