**Abstract**

This research presents a process for rendering a simulated flight above Chicago in the Unreal Engine with Cesium for use in an immersive experience. Cesium’s geospatial data offers detailed rendering of Earth's surface suitable for flight simulations, particularly over urban areas. Cesium’s Asset Depot includes areas with extra details that further enrich the visual fidelity of the available areas. Cesium offers seamless navigation across Earth's surface with challenges and limitations in level of detail management, customizing flight paths, and managing sublevels. Issues such as grid lines, tile errors, and rural area rendering discrepancies are covered. Overall, this research provides insights into the strengths and limitations of using Cesium in the Unreal Engine for creating immersive flight simulation experiences.

**Conclusion**

Using Cesium in the Unreal Engine is a significant tool that can be used effectively for immersive simulations of flights with an understanding of the strengths and limitations of each platform for rendering realistic flight simulations. Cesium offers many tools and settings to resolve, mitigate, or avoid issues such as reflective surfaces, tiling, and shadow errors that may affect rendering quality, particularly at lower altitudes. Outside assets can be used appropriately to optimize objects requiring higher detail, clouds and foliage. Continued advancements in geospatial rendering technologies offer promising opportunities for creating immersive and realistic virtual environments in Unreal Engine, catering to diverse simulation needs and enhancing user experiences.