

ABSTRACT

This internship was carried out at the Metaverse Research & Experience Center (MREC), Telkom University, in the form of a project contribution for PT. Pertamina Hulu Rokan (PHR). The main challenge encountered was the high complexity and large size of 3D assets from Navisworks (.nwd) files, which were not optimal for use in the development of Augmented Reality (AR) and Mixed Reality (MR) applications. These assets required conversion and optimization to ensure lightweight and efficient performance when deployed on mobile devices and VR headsets.

The author was responsible for retopology, geometry cleanup, and asset conversion to Unity, using an automation-based engineering approach. To improve workflow efficiency and reduce repetitive manual tasks, two Python scripts were developed utilizing Blender's API. The first script removes all materials from selected mesh objects to prevent duplicate materials that burden rendering. The second script deletes all Empty objects in the scene generated from Navisworks conversion, as these objects provide no visual contribution but complicate the asset hierarchy.

The use of these scripts significantly accelerated and simplified the asset optimization process, making the workflow more efficient, consistent, and standardized. The optimized assets were packaged into UnityPackage format and handed over to the AR/MR development team. Based on feedback, the optimized assets met technical requirements and were fully compatible with AR and MR platforms. These results demonstrate that automation through Python scripting can be an effective method to support 3D-based interactive multimedia production pipelines.

Keywords: 3D Optimization, Navisworks, Blender, Unity, AR, MR, Python Script, Retopology.