

# Simulated Survey Training Using Game Engine

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## SUMMARY

Game engines that are used to make 3D games has an infinite range of applications. They don't stop at designing games but they can be implemented in almost everything we can imagine, and users can try various experiences inside the space created by game engines. Metaverse is an example. In the metaverse, interactions among users as well as things that are impossible in real life can be experienced with just one personal computer. As surveying involves a variety of complex situations, experienced and reliable engineers are required who are familiar with operating surveying equipments in various terrains. However, it is time-consuming and expensive to field train surveyors in different types of terrains. This paper explores an alternative approach that uses a game engine and 3D modeling to create various terrains and experience various surveying conditions. Fortunately, game engines supports very accurate location information, in particular, Unreal Engine supports the WGS84 coordinate system, providing an optimal environment for creating a surveying simulation space. The game engine provides a high level of immersion with a feeling of being in the real place using real equipments through 3D graphics processing featuring high-quality light, shadow, and material rendering. This provides a much deeper understanding than simply learning from texts. In this paper, it will be showed how complex terrains are created using a 3D modeling program, and how they are loaded in Unreal Engine and appear on the screen. Trainees can view various terrains or enter the game engine to look around the environment, learn how to survey by selecting a terrain they are not familiar with, and learn and practice how to use surveying equipment suitable for the situation. Applying this process will dramatically improve the skills of a surveying engineer.