

3D DATA PROCESSING FOR VR VISUALIZATION: A CASE STUDY OF THE "PODGÓRZE" URANIUM MINE

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Recent advances in computing, rendering, and display technologies have made virtual reality (VR) more accessible. VR allows users to explore computer-generated environments that are often difficult or impossible to access in real life. Particularly interesting environments to explore with 3D models are the historic tunnels of old mines to be explored.

Terrestrial Laser Scanning (TLS) technology offers accuracy down to a few millimetres, making it an effective tool for detailed documentation of objects. The technology enables 3D mapping of underground environments, such as active and historic underground mines, and once properly processed, these visualisations can be used in VR to provide greater insight and understanding of these complex environments.

This study presents the process of generating virtual 3D models using the example of the historic Podgórze uranium mine. The research focuses on the creation of detailed digital representations of the underground mine structures and their post-processing for integration into the Unreal game engine. The workflow consists of several key stages, including data acquisition, 3D data processing and model creation, as well as their integration into the game environment.