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GIS-BASED SURFACE ANALYSIS OF ARCHAEOLOGICAL FINDS

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Abstract. The international research project HiMAT (History of Mining Activities in the Tyrol and adjacent areas) is dedicated to the study of mining history in the Eastern Alps by various scientific disciplines. The aim of this program is the analysis of the mining activities ' impacts on environment and human societies. Unfortunately, there is only a limited number of specific regions (e.g. Mitterberg) to offer possibilities to investigate the former mining expansions. Within this multidisciplinary project, the archaeological sites and finds are analyzed by the Surveying and Geoinformation Unit at the University of Innsbruck. This paper shows data fusion of different surveying and post-processing methods to achieve a photo-realistic digital 3D model of one of these most important finds, the Bronze Age sluice box from the Mitterberg. The applied workflow consists of four steps: 1. Point cloud processing, 2. Meshing of the point clouds and editing of the models, 3. Image orientation, bundle and image adjustment, 4. Model texturing. In addition, a short range laser scanning survey was organized before the conservation process of this wooden find. More accurate research opportunities were offered after this detailed documentation of the sluice box, for example the reconstruction of the broken parts and the surface analysis of this archaeological object were implemented using these high-resolution datasets. In conclusion, various unperceived patterns of the wooden boards were visualized by the GIS-based tool marks investigation.

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