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ANNOUNCEMENT BACHELOR THESIS

Investigating the Potential of Low-Cost Photogrammetry Systems in the Mining Industry

Description

Laser scanning and digital photogrammetry are widely used in surveying for mapping and creating 3D representations of objects. These methods generate point clouds from LiDAR data or images, from which detailed 3D models can be constructed. In mining, these models are crucial for tasks like estimating the volume of material stored or moved, assessing stability, and, when combined with other data, digital elevation models can be used to construct geological models. Different tasks require varying levels of precision, with high precision needed for stability analysis and lower precision acceptable for tasks like stockpile volume estimation. The precision of 3D models depends on several factors, including the sensor system, data acquisition technique, data processing methods, and positioning accuracy.

This **thesis aims** to compare the quality and precision of 3D models generated with low-cost photogrammetry systems with those created using LiDAR data. Additionally, the potential of using low-cost GNSS receivers to improve the accuracy of camera positioning for photogrammetry will be investigated.

Tasks

1. Literature review of the use of laser scanning and photogrammetry techniques for mining applications.
2. Plan and perform fieldwork for acquiring LiDAR and photogrammetry data.
3. Data processing and quality assessment: comparison of two 3D models obtained from LiDAR data and digital photogrammetry.
4. Investigate the possibility of increasing the precision of 3D models obtained using low-cost photogrammetry systems.
5. Investigate the potential of using low-cost GNSS receivers to provide positional information of the camera.

Requirements

Basic understanding of geodetic measurements. Basic knowledge of photogrammetric techniques is preferable. The thesis should be written in English.

Start of work: as soon as possible.

Contact

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