

عنوان مقاله:

Application of Drone-Based Data for Directing Exploration Activities and Estimating Resources in Emperador Marble Quarry, Kerman Province, Iran

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خلاصه مقاله:

This research work aims to discuss the methodology of using the drone-based data in the initial steps of the exploration program for the dimension stone deposits. A high-resolution imaging is performed by a low-cost commercial drone at the Emperador marble quarry, Kerman province, Iran. A ground resolution of 3 cm/pix is achieved by imaging at an altitude of 70 m in order to ensure the precise lithological and structural mapping. An accuracy of less than 5 cm is promised for the 3D photogrammetric products. Hence, the flight is performed with an 80% front and a 70% lateral image overlap. Furthermore, 18 ground control points (GCPs) are used in order to meet the required accuracy. Photogrammetric processing is done by the Agisoft PhotoScan software. The geology map is prepared through the visual geo-interpretation of the orthophoto image. The faults and fractures are delineated using the high-resolution orthophoto and hill-shade model in the ArcGIS software. Accordingly, the density map of fractures is produced, and the deposit is divided into five structural zones. The 3D deposit model with an accuracy of 2.8 cm is reconstructed based on the digital elevation model (DEM). A primary block model is generated using the 3D deposit model in the Datamine software in order to determine the resource for each structural zone. Finally, considering the amount of resource and situation of fractures, the priority of exploration for developing activities and appropriate methods is defined for each structural zone. The research work results have convinced us to include drone-based imagery in the initial steps of dimension stone exploration to consume the time and cost of the operation.

کلمات کلیدی:

drone-based imagery, Photogrammetry, 3D deposit model, block model, reserve estimation

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