

EVALUATION OF AN AUTOMATIC PHOTOGRAMMETRY SYSTEM WITH DIGITAL IMAGING IN AN OPEN PIT MINE

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Evaluation of an Automatic Photogrammetry System with Digital Imaging in an Open Pit Mine¹ITO,Toshihide, ²NISHIYAMA,Takashi, ³OMURA,Makoto¹Kansai University, Osaka, Japan; ²Kyoto University, Kyoto, Japan; ³Kochi Women's University, Kochi, Japan The automatic measuring system with digital image has gradually become more practical as a result of an improvement in image processing. That is, with the latest equipment, one arbitrary point can be identified in a digitized photograph image through image analysis so that automatic measurement of three-dimensional coordinates from identified parallax differences is now possible. Therefore, if several tie points are given from a pair of photographs, the other points can be measured automatically. Though it is difficult to identify all the points accurately in photograph images, some automatic photogrammetry has been developed which is able to identify numerous points. Other automatic measuring systems, such as the GPS (Global Positioning System) which identifies a three-dimensional position using satellites, and TS (Total Station, Electro-optical Distance Measuring Instrument) which identifies a three-dimensional position using light waves, are also available. However, these measuring systems have limitations because they can measure only points, not the surface. It needs a complex operation to interpolate the appropriate altitudes for measuring the entire surface. On the other hand, in open pit mines such as limestone or crushed stone mines, topographic data must be up to date to manage the working face. Therefore the automatic photogrammetry system using digital images has been tested. When the results were compared to both GPS and TS, the differences in the horizontal and vertical directions were from 5cm to 48cm on average. These values are acceptable for practice.