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ANALYSIS OF 3D PHOTOGRAMMETRIC RECONSTRUCTION

Keywords: *photogrammetry, epipolar geometry, 3D reconstruction.*

The paper brings information about process of analytic reconstruction of 3D real data of selected objects from photographic images using software application CamWitt. This interactive tool was developed for filtration of data recordings, automatic detection of objects in the images and exact determination of dimensional and positional characteristics that enable correct identification of recorded objects and their real dimensions. Algorithm for calculation of real dimensions is based on geometric principles of photogrammetry and epipolar geometry.

Various solutions improving accuracy of the resulting real data are described and analysed, and 3D visualisation GeoGebra applet for understanding proposed corrections to algorithm and their geometric interpretation is presented. Methods of underlying principles of epipolar geometry are introduced in brief.

Presented facts are results of the project of the Slovak Research and Development Agency APVV-1061-12 entitled „Determination of geometric characteristics of objects obtained from criminological relevant image recordings" coordinated by the Slovak University of Technology in Bratislava, with partner Criminological and Expertise Institute of Ministry of Defence of SR. Project aims to development of a correct and precise algorithms for processing of geometric characteristics and reconstruction of dimensions and position of selected objects in photographic images of 3D scenes. Its results will be used for practical applications in criminology, for detection of criminal acts, in collection and analysis of proofs of evidence recorded on images and during identification of suspected criminals.
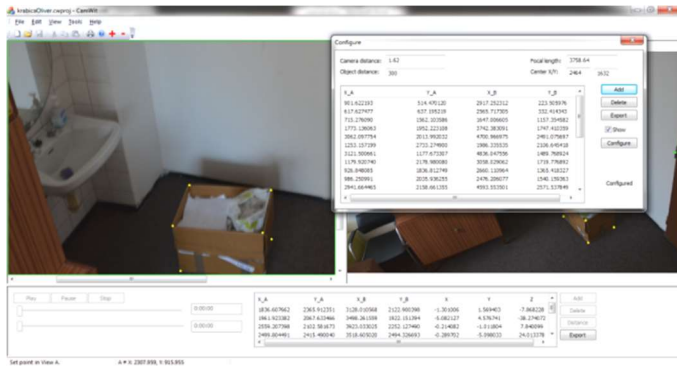
Fig. 1 CamWitt application interface.

In Fig. 1, view of the user interface of developed software application CamWitt for reconstruction of data is presented. Data from two photographic images of a real 3D scene can be analyzed, while manual correspondence of selected points on objects is performed resulting in automatic calculation of object´s real dimensions

Acknowledgements

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