Volume XL-4/W3

A method of 3D-GIS application aided with stereo panorama technology

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Abstract. So far, three-dimensional geographic information system (3DGIS) has been developed and applied to many fields. However, data capturing is a challenge for complex environment modeling and visualization. Panorama is an elegant method for users to get a real view without being plagued by 3D measurement and modeling. Although someone claimed that panoramas can offer the function of measurement, the results are widely considered not reliable. 3D images composited by laser scanner data are another kind of precise data source to replace traditional 3D modeling. Laser scanners have obvious shortcomings, such as vast data and time-consuming processes. We propose a method of using stereo panorama technology to complement the three-dimensional data acquisition, processing and management. By using two cameras combined with MTI sensors, which provide pose and position measurement. We can obtain the stereo panorama at one time, which enables users to measure positions and orientations of particular features. The panorama can be uploaded to the 3D-GIS in a custom transmission format to provide stereo browsing of data capture sites. Combined with photogrammetry technology, users can also get accurate results by measuring interesting features on the panorama through interactive measurement interface. Based on Google Earth platform, we verified the effectiveness of our developed system. It stands out from traditional methods with its irreplaceable superiority in local 3D data acquisition and updating, as well as its direct data measurement.

Conference Paper (PDF, 632 KB)

Citation: Sun, M., Dong, N., Zheng, H., Jiang, C., and Ren, X.: A method of 3D-GIS application aided with stereo panorama technology, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XL-4/W3, 123-130, doi:10.5194/isprsarchives-XL-4-W3-123-2013, 2013.

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