

A NEW METHOD FOR PERSPECTIVE CENTRE ALIGNMENT FOR SPHERICAL PANORAMIC IMAGING

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ABSTRACT

An arrangement for adjusting a camera to a spherical panoramic camera head is described. This device was developed for spherical panoramic imaging and it enables arbitrary rotation and tilting of the camera around the focal centre of the adjusted camera. After the camera adjustment, the central projections of the original images of the sequence are preserved.

For the adjustment, a set of special targets was designed and manufactured. The adjustment was based on collinearity and thus two intersecting horizontal calibration lines were used. Ordinary theodolite and level were used for the calibration line setup. With the two fixed directions, the sideward and back and forth directions of the camera cradle movements could be determined. Horizontal axis height was levelled and brought to the targets to tie up the vertical position of the camera.

The achieved perspective centre uncertainty was approximated to be about 1 millimetre. This estimation was based on analysis of the parallaxes caused by known misalignments of such order. The misalignments noticeably affected to the target pattern in the images, and thus we come to a conclusion of maximum uncertainty of this magnitude.