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APPLYING CCD CAMERAS IN STEREO PANORAMA SYSTEMS FOR 3D ENVIRONMENT RECONSTRUCTION

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Abstract. Proper recontruction of 3D environments is nowadays needed by many organizations and applications. In addition to conventional methods the use of stereo panoramas is an appropriate technique to use due to simplicity, low cost and the ability to view an environment the way it is in reality. This paper investigates the ability of applying stereo CCD cameras for 3D reconstruction and presentation of the environment and geometric measuring among that. For this purpose, a rotating stereo panorama was established using two CCDs with a base-length of 350 mm and a DVR (digital video recorder) box. The stereo system was first calibrated using a 3D test-field and used to perform accurate measurements. The results of investigating the system in a real environment showed that although this kind of cameras produce noisy images and they do not have appropriate geometric stability, but they can be easily synchronized, well controlled and reasonable accuracy (about 40 mm in objects at 12 meters distance from the camera) can be achieved.

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