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CALIBRATION OF A MULTIPLE STEREO AND RGB-D CAMERA SYSTEM FOR 3D HUMAN TRACKING

K. Amliantitis, M. Adduci, and R. Reulke
Humboldt Universität zu Berlin Computer Science Department, Computer Vision Rudower Chaussee 25, 12489 Berlin, Germany

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Abstract. Human Tracking in Computer Vision is a very active up-going research area. Previous works analyze this topic by applying algorithms and features extraction in 2D, while 3D tracking is quite an unexplored field, especially concerning multi-camera systems. Our approach discussed in this paper is focused on the detection and tracking of human postures using multiple RGB-D data together with stereo cameras. We use low-cost devices, such as Microsoft Kinect and a people counter, based on a stereo system. The novelty of our technique concerns the synchronization of multiple devices and the determination of their exterior and relative orientation in space, based on a common world coordinate system. Furthermore, this is used for applying Bundle Adjustment to obtain a unique 3D scene, which is then used as a starting point for the detection and tracking of humans and extract significant metrics from the datasets acquired. In this article, the approaches are described for the determination of the exterior and absolute orientation. Subsequently, it is shown how a common point cloud is formed. Finally, some results for object detection and tracking, based on 3D point clouds, are presented.

[Conference Paper](#) (PDF, 5936 KB)

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