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X-Corner Detection for Camera Calibration Using Saddle Points

Authors : Abdulrahman S. Alturki, John S. Loomis

Abstract : This paper discusses a corner detection algorithm for camera calibration. Calibration is a necessary step in many computer vision and image processing applications. Robust corner detection for an image of a checkerboard is required to determine intrinsic and extrinsic parameters. In this paper, an algorithm for fully automatic and robust X-corner detection is presented. Checkerboard corner points are automatically found in each image without user interaction or any prior information regarding the number of rows or columns. The approach represents each X-corner with a quadratic fitting function. Using the fact that the X-corners are saddle points, the coefficients in the fitting function are used to identify each corner location. The automation of this process greatly simplifies calibration. Our method is robust against noise and different camera orientations. Experimental analysis shows the accuracy of our method using actual images acquired at different camera locations and orientations.

Keywords : camera calibration, corner detector, edge detector, saddle points
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