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论文

一种基于非量测畸变校正的摄像机标定方法

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摘要：

设计一种基于非量测畸变校正的摄像机标定方法. 该方法利用单参数除式模型校正镜头畸变, 根据直线透视投影保留同素性, 通过拉格氏法(LM) 优化标定出畸变模型系数和摄像机主点坐标, 然后校正成像点, 使其满足针孔模型映射关系. 根据内参数的两个基本方程, 线性求解剩余参数. 实验表明, 该方法在非量测标定过程具有较好
的鲁棒性, 且对比张正友标定方法, 可在单幅标靶图像下进行标定, 避免了模型内外参数耦合在一起, 提高了标定效
率.

关键词： 摄像机标定；除式模型；畸变校正；非量测；单应矩阵

A camera calibration method based on non-metric distortion correction

Abstract:

A camera calibration method based on non-metric distortion correction is proposed. In this method, single
parameter division model is used to correct lens distortion, and based on the same geometric type between straight line and
its projection image, the LM(Levenberg Marquardt) scheme is applied to obtain the distortion parameter and the principal
point by optimization. Then, the actual image point is corrected in order to satisfy the pinhole camera model. Based on the
two basic constraint equations about camera intrinsic parameters, the remaining camera parameters can be solved linearly.
Experimental results show that this method has better robustness in the non-metric distortion correction process. And by the
comparison with Zhang's method, camera can be calibrated by using only single image, which avoids the coupling between
intrinsic and extrinsic camera parameters, and the efficency of calibration is improved.

Keywords: camera calibration；division model；distortion correction；non-metric；homography matrix

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