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计量测试

CCD摄像系统镜头的畸变测量

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摘要 从畸变定义出发，讨论了畸变数学模型，
介绍了精密测角法与比长法综合测量畸变的原理。通过放大率法标定出CCD探测器的像素距离当量，
通过质心法求出点目标的质心，
质心与原点的像素距离乘以像素距离当量得到精确长度。利用正切函数求出绝对畸变值，
用最小二乘法解多组数据超定方程，
求出拟和公式的系数。实际计算和数据处理结果表明：畸变数学模型在中视场范围内拟合效果很好。

关键词 畸变 视场 数学模型 定位精度
分类号 TN06

Distortion measurement of lens in CCD camera system

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Abstract The mathematic model for distortion is discussed. The distortion measurement with a precision goniometer and a bench comparator is introduced. The pixel distance equivalent of the CCD detector was calculated by the magnification method. The centroid of point target was derived by the centroid method. The pixel distance between the centroid and the origin on the image plane was multiplied by the pixel distance equivalent to achieve accurate distance. The absolute distortion was acquired by tangent function. The equation was worked out to calculate the coefficient. The results of the calculation and data processing indicate that the fitting effect of the distortion mathematic model is satisfactory in medium field of view.

Key words distortion field of view mathematic model position accuracy

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