论文与报告

一种反射折射摄像机的简易标定方法

邓小明, 吴福朝, 吴毅红

National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing 100080, P.R.China

摘要
Central catadioptric cameras are widely used in virtual reality and robot navigation, and the camera calibration is a prerequisite for these applications. In this paper, we propose an easy calibration method for central catadioptric cameras with a 2D calibration pattern. Firstly, the bounding ellipse of the catadioptric image and field of view (FOV) are used to obtain the initial estimation of the intrinsic parameters. Then, the explicit relationship between the central catadioptric and the pinhole model is used to initialize the extrinsic parameters. Finally, the intrinsic and extrinsic parameters are refined by nonlinear optimization. The proposed method does not need any fitting of partial visible conic, and the projected images of 2D calibration pattern can easily cover the whole image, so our method is easy and robust. Experiments with simulated data as well as real images show the satisfactory performance of our proposed calibration method.
关键词　 Central catadioptric camera　 calibration　 2D calibration pattern　 computer vision
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通讯作者　邓小明 xmdeng@nlpr.ia.ac.cn
作者个人主页　邓小明; 吴福朝; 吴毅红

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