Abstract

Several kinds of distortions exist in imaging systems which in specific circumstances may affect an image’s geometry without debilitating quality or diminishing the information existing in the image. The most important type is the radial distortion which represents high distortion accurately. Many lens distortion models exist combined with several variations where different techniques are used to calibrate each distortion model. This paper presents an algorithm to select automatically the best lens distortion model for four lenses of different focal length using different statistical information criterion without sacrificing a significantly lower error. The used method requires a simple chessboard pattern, which observed from different position and calibrated using Zhang method, to compute the complexity of the lens distortion model automatically.

The result shows the 6th order radial distortion model is the best model with the minimum error about -0.273 for lens of focal length 30.64 mm using MDL criteria, while at 4th order the minimum error about -0.177, and at 2nd order about -0.112.
The Automatic Selection of Radial Distortion Models

References


4. EL-Melegy MT, Farag AA, 2003, Nonmetric Lens Distortion Calibration: Closed-form Solutions, Robust Estimation and Model Selection, InICCV.


Index Terms

Computer Science

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Keywords

Camera Calibration, Radial Distortion, Lenses