Using linear combination form and camera calibration matrices to preserve the rank 2 property of estimated fundamental matrices

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Abstract

This paper proposes an approach to preserve the rank-2 property of fundamental matrices from noisy input data when the camera calibration matrices are known. A fundamental matrix can be expressed as the linear combination of its basis matrices when the calibration matrices of cameras are known. The problem of fundamental matrix estimation becomes to solve a homogeneous linear system, and the estimated fundamental matrix maintains the characteristics of a theoretical fundamental matrix with good accuracy. The simulation results show that the proposed method still can determine a fundamental matrix with rank 2 even when the input data contain large noise. Moreover, the proposed method has the advantage of very light computation load.

Keyword：