

论文

一种具有自适应非均匀校正功能的非制冷焦平面探测器组件

金伟其¹,曹扬¹,刘崇亮¹,刘秀¹,董立泉¹,张长泉²

1.北京理工大学光电成像与信息工程研究所,北京100081;
2.北京特种车辆研究所,北京100072

摘要:

基于场景的非均匀校正算法(scene based nonuniformity correction,SBNUC)是非均匀校正技术今后的重点发展方向,介绍了近年来基于恒定统计约束的SBNUC、神经网络的SBNUC和运动估计的SBNUC算法的研究进展。研究了SBNUC算法在实际焦平面探测器组件上的实现方法,该方法仅依赖拍摄序列的信息对焦平面探测器的增益和偏置参数进行组间更新或帧间更新,可有效补偿温漂。研制了一种具有自适应非均匀校正功能的非制冷焦平面探测器组件,红外视频经该组件处理后,图像质量有所提高。该组件可明显提高热成像系统的成像性能,并能动态地保证热成像系统随场景变化的稳定性。

关键词: 红外焦平面阵列 固定模式噪声 非均匀校正

Uncooled infrared focal plane array detector module with the self-adaptive non-uniformity correction function

JIN Wei-qi¹;CAO Yang¹;LIU Chong-liang¹;LIU Xiu¹;DONG Li-quan¹;ZHANG Chang-quan²

1.Dept of Optical Engineering; Beijing Institute of Technology; Beijing 100081, China; 2.Beijing Special Vehicle Institute, Beijing 100072, China

Abstract:

Non-uniformity correction (NUC) for the IRFPA has become one of the most important issues for defense electro-optics. Scene-based non-uniformity correction (SBNUC) is the major trend of NUC techniques in the future. In this paper, the author introduces the research progress in SBNUC technique based on the constant statistic constraint, neural network, and motion estimation. The method to combine SBNUC algorithms with infrared focal plate array (IRFPA) detector module is presented, and the uncooled IRFPA detector module with self-adaptive non-uniformity correction function is developed. The proposed algorithms can use only image sequence information to calculate the gain/bias parameters and update them group-by-group or frame-by-frame, compensating the FPN temporal variation effectively. The detector module can improve the image performance of the imaging system significantly, and ensure the stability of the imaging system with the scene motion dynamically.

Keywords:

IRFPA fixed pattern noise non-uniformity correction

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作者简介:

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