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论文

红外气动退化图像复原校正的复合算法研究

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摘要：

鉴于气动效应图像退化因素的复杂性和随机性，单一复原算法难以满足要求，提出构造复合算法来提高湍流退化图像复原质量的思路，综合各种基于不同理论模型和应用对象的实用算法，实现优势互补。给出了现有算法结合的主要途径，主要探讨了基于统计理论的MAP复原算法与基于正则化理论的总变分算法复合后各算法结构的自适应调整和改造以及各种参数的自适应性选择问题。充分利用各算法的优势，完成基于算法结构相对稳定的智能化组合。在微机上进行了一系列的复原对比实验。实验结果表明：复合算法提高了图像的总体复原质量。

关键词： 高速流场 图像复原 算法融合

Compound algorithm for restoration of infrared turbulence-degraded image

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Abstract:

Due to the complexity and randomness of image degradation caused by the aero-optics effects，it is difficult for a single restoration algorithm to reach the requirement of restoration. A scheme to construct a compound algorithm to improve the quality of restoration image is proposed, in which some useful algorithms based on different theoretical models and targets are synthesized, and their advantages are combined to make full use of their superiority. Major compound algorithms are given in this paper. The adaptive adjustment and reformation of various algorithm structures as well as the adaptability selection of various parameters, after the combination of statistics theory based MAP restoration algorithms with regularization theory based total variation algorithm, are discussed. The intelligent combination of various algorithm structures is accomplished to achieve their superiority. Some comparisons on restoration were made on microcomputers, and the experiment results show that the proposed compound algorithm improves the overall quality of restored images.

Keywords: high-speed flow field image restoration algorithm fusion

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