

基于视觉感知特性的多聚焦图像融合技术 Research of Image Fusion Algorithm Based on Human Visual Perception Feature

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摘要: 针对多聚焦图像融合问题, 借鉴生物视觉特性和相关图像处理理论, 提出了一种基于视觉感知特性的多聚焦图像融合算法。该算法在对待融合的多聚焦图像进行RGB分块分解的基础上, 采用视觉对比度模型以确定融合后图像的选取准则。为了获得最佳图像融合效果, 采用免疫遗传算法以指导图像分块, 标准熵和标准偏差作为评价图像融合质量的的标准。实验表明, 该算法具有较好的效果, 能够解决多聚焦图像融合问题。To solve the problem of multi-focus image fusion, a new multi-focus image fusion algorithm based on the visual perception feature was proposed. Because the threshold of human visual contrast sensitivity was proportional to the image background brightness, the visual uniform parameter was adopted to separate clear objects from fuzzy objects obtained by different image sensors. Firstly, the image was decomposed at RGB level separately. Secondly, the R,G,B single gray image was divided into sub-blocks. Thirdly, the sub-blocks with higher uniform value were selected as the corresponding sub-blocks of fusion image. Then, the retained sub-blocks were reconstructed to compose the fusion image. The immune genetic algorithm was applied to calculate the optimal number of sub-blocks, and the image quality criterion data, root-mean-square error and image entropy, were chosen as the affinity function of the optimal algorithm. The results have shown that the image fusion algorithm proposed was suitable to multi-focus image fusion and easy to realize.

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