

非局部学习字典的图像修复

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Image Inpainting Based on Non-local Learned Dictionary

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摘要

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摘要 该文提出一种新的基于学习的图像修复算法。与经典的稀疏表示模型不同, 该文将非局部自相似图像块统一进行联合稀疏表示, 训练高效的学习字典, 并使自相似块间保持相同的稀疏模式。该方法既确保自相似块投影到稀疏空间后也具有相似性, 也较好地保留了自相似块间的相关性信息, 更有效地建立了它们的联合稀疏关联, 并将这种关联作为先验知识来指导图像的修复。该算法使用大量自然图像样本来训练初始的过完备字典, 既利用了样本图像的先验知识, 又充分考虑了待处理图像本身的相关信息, 自适应性强。通过对自然图像进行大、小范围图像修复和文字去除实验, 该文方法均取得不错的修复效果。

关键词: 图像修复 学习字典 稀疏表示 联合稀疏近似 非局部

Abstract: A novel learning-based image inpainting method is presented. As a further development of classical sparse representation model, the non-local self-similar patches are unified for joint sparse representation and learning dictionary, in which each element of the self-similar patches has the same sparse pattern. The method assures the self-similar patches possess similarity when projected on the sparse space, and efficiently builds the sparse association among them. This association is next taken as a priori knowledge for image inpainting. The paper uses numerous samples and non-local patches of input image to train overcomplete dictionary. The method not only takes into account the priori knowledge of samples, but also considers the non-local self-similar information of input image. Large and small region inpainting experiments and text removing experiments on natural images show the good performance of the method.

Keywords: Image inpainting Learning dictionary Sparse representation Simultaneous sparse approximation Non-local

Received 2010-12-27;

本文基金:

国家973计划项目(2007CB714406), 中国博士后基金特别资助项目(200902609)及电子科技大学青年科技基金重点项目(JX0804)资助课题

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引用本文:

李民, 程建, 李小文, 乐翔.非局部学习字典的图像修复[J] 电子与信息学报, 2011,V33(11): 2672-2678

Li Min, Cheng Jian, Li Xiao-Wen, Le Xiang. Image Inpainting Based on Non-local Learned Dictionary[J], 2011,V33(11): 2672-2678

链接本文:

<http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2010.01426> 或 <http://jeit.ie.ac.cn/CN/Y2011/V33/I11/2672>

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