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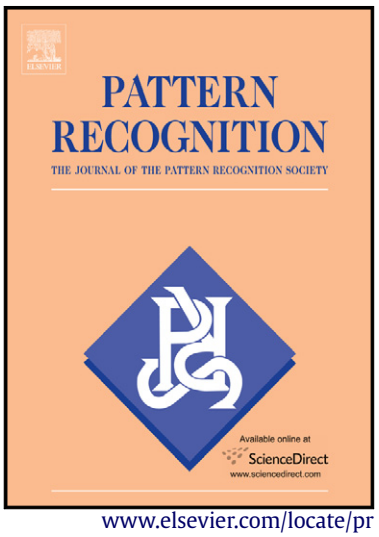

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Global consistency, local sparsity and pixel correlation: A unified framework for face hallucination

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Abstract

In this paper, a novel two-phase framework is presented to deal with the face hallucination problem. In the first phase, an initial high-resolution (HR) face image is produced in patch-wise. Each input low-resolution (LR) patch is represented as a linear combination of training patches and the corresponding HR patch is estimated by the same combination coefficients. Realizing that training patches similar with the input may provide more appropriate textures in the reconstruction, we regularize the combination coefficients by a weighted ℓ_2-norm minimization term which enlarges the coefficients for relevant patches. The HR face image is then initialized by integrating all the HR patches. In the second phase, three regularization models are introduced to produce the final HR face image. Different from most previous approaches which consider global and local priors separately, the proposed algorithm incorporates the global reconstruction model, the local sparsity model and the pixel correlation model into a unified regularization framework. Initializing the regularization problem with the HR image obtained

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