STRUCTURE AND TEXTURE IMAGE DECOMPOSITION WITH LOCAL GRADIENT CONSTRAINT

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ABSTRACT

In this paper, a new model for structure/texture decomposition using local gradient constraint is presented. This constraint is inspired by the fact that the gradients of structure component u are close to the gradients of given image f in locally piecewise smooth regions. We consider the TV-Hilbert model [1,2] as a blur and deblur process for the image decomposition. By incorporating the additional local constraint of image gradient into the classical TV-Hilbert model, we can derive a new image decomposition model. The proposed model can separate texture component v from the given image f effectively while it can preserve sharp edges and keep homogeneous regions in structural component u without causing staircase artifacts. Numerical experiments demonstrate the efficiency of our proposed model in comparison with existing state-of-the-art image decomposition approaches.

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