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Unsupervised texture segmentation using Gabor filters â˜†

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Abstract

This paper presents a texture segmentation algorithm inspired by the multi-channel filtering theory for visual information processing in the early stages of human visual system. The channels are characterized by a bank of Gabor filters that nearly uniformly covers the spatial-frequency domain, and a systematic filter selection scheme is proposed, which is based on reconstruction of the input image from the filtered images. Texture features are obtained by subjecting each (selected) filtered image to a nonlinear transformation and computing a measure of â€œenergyâ€ in a window around each pixel. A square-error clustering algorithm is then used to integrate the feature images and produce a segmentation. A simple procedure to incorporate spatial information in the clustering process is proposed. A relative index is used to estimate the â€œtrueâ€ number of texture categories.

Keywords

Texture segmentation; Multi-channel filtering; Gabor filters; Wavelet transform; Clustering; Clustering index

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