

Gagnon, L., Foucher, S. "Segmentation of non-natural objects in landscape images using ridgelet transform" *Journal of Electronic Imaging*, 18 (2) Apr–Jun 2009 : 023010.

Abstract

This study reports about the detection of non-natural structures in outdoor natural scenes. In particular, we present a new approach based on ridgelet transform for the segmentation of manmade objects in landscape scenes. Multiscale directional moments of ridgelet coefficients are used as features along with a principal component analysis (PCA) followed by a linear discriminant analysis (LDA), kernel-based LDA (KLDA), or support vector classifier (SVC). The statistical learning is done on about 3,000 image patches that represent natural and artificial content. Performances are measured in terms of image patch type classification (natural versus nonnatural) and man-made object segmentation on two different image test sets. Results using ridgelets are compared to Gabor features. Altogether, we compare performance for six different feature/ classifier combinations: ridgelets+LDA, ridgelet+KLDA, ridgelets +SVC, Gabor+LDA, Gabor+KLDA, and Gabor+SVC, and various external parameter values. Results show that most of the time, the combinations with ridgelets provide comparable or better performance.