

# **Land Use/Land Cover Classification With Multispectral and Hyperspectral Eo-1 Data: A Comparison**

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In this paper, we compared the capability of the Earth Observing-1 (EO-1) Hyperion hyperspectral (HS) data with that of the IRS LISS-III multispectral (MS) data for discriminating different land use/cover classes in Guntur district of Andhra Pradesh, India. Classification results indicate that the kappa coefficient obtained with the HS image (161 bands) is 3% higher than that obtained with the MS image (4 bands) when we directly applied a Mahalanobis distance (MD) classifier. We compared a number of feature reduction and extraction algorithms for the HS image. The feature extraction algorithms used for band reduction include principal component analysis (PCA), segmented PCA (segPCA), linear discriminant analysis (LDA), and segmented LDA (segLDA). Feature reductions were all followed by an MD classifier for image classification. With segLDA and LDA, similar accuracies were achieved while a segmentation-based approach greatly improved computation efficiency. They outperformed segPCA and PCA by 5% in classification accuracy. Overall accuracies obtained by using the features extracted from the HS image were 11% greater than those obtained with the MS image. Accuracies for land cover classes did not change much for either HS or MS, but the HS data generally produced better results than the MS data for land use classes.