Bayes Classification of Interferometric AIRSAR Data.

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We report the Bayes classification of terrain types at different sites using airborne interferometric synthetic aperture radar (I NSAR) data. A Gaussian maximum likelihood classifier was applied on multidimensional observations derived from the SAR intensity, the terrai n elevation model, and the magnitude of the interferometric correlation. Training sets for forested, urban, agricultural, or bare areas were obtain either by selecting samples with known ground truth, or by k-means clustering of random sets of samples uniformly distributed across all sites, and subsequent assingments of these clusters using ground truth. The accuracy of the classifier was used to optimize the discriminating efficien cy of t he set of features that were chosen. The most important features include the SAR intensity, a canopy penetration depth model, and the terrain slope.

We demonstrate the classifier's performance across sites using a unique set of training classes for the four main terrain categories. The scenes examined include San Francisco (predominantly urban and water), Mount Adams (WA) (forested with clear cuts), Pasadena (urban with mountains), and Antioch Hills (CA) (water, swamps, fields). Isssues related to the effects of image calibration and the robustness of the classification to calibration errors are explored. The relative performance of single polarization Interferometric data classification is contrasted against classification schemes based on polarimetric SAR data.

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