

Effects of hyperspectral data transformations on urban inter-class separations using a support vector machine

ABSTRACT

This study investigated the performance of different data types used in a hyperspectral data classification process. Data in the form of spectral reflectance, first derivative spectra and wavelet coefficients were used as inputs for the Support Vector Machine (SVM) algorithm used to classify five different classes. The first derivative spectra gave a lower classification accuracy (35.6%) than the spectral reflectance (82%) and the use of wavelet coefficients further improved the classification accuracy to 100%. Proper selection of the wavelet transformation method, the mother wavelet, the number of vanishing moments and the decomposition level could improve classification accuracy. In summary, wavelet coefficients could maximise discrimination capability as compared to the spectral reflectance and first derivative spectra.

Keyword: Hyperspectral; First derivative; Wavelet coefficients; Support vector machine