Binary Weights to Neighbouring Pixels Based Resolution Enhancement Mapping of Hyperspectral Image

Abstract:

Per pixel classification algorithms are incapable of mapping the land cover classes at its sub pixel level. The solution to this problem is to make the spatial resolution finer than the original data and arrange the sub pixels according to the fractional cover of each of the classes in the pixel and their class distribution in neighboring pixels. In this paper, an algorithm, named as ‘pixel filling algorithm’ for super resolution mapping has been proposed. The algorithm considers the information from the neighboring pixels of pixel to be super-resolved and treats all the classes equal to produce fine spatial resolution maps. The performance of the algorithm has been tested on a synthetic dataset as well as on a hyperspectral data. The datasets were reduced by Daubechies 4 wavelets and then a 3×3 filter was applied to make the datasets coarser. The overall accuracy of super resolution algorithm for synthetic data and hyperspectral data are calculated as 96.3 percent and 83.6 percent, respectively for the whole data and 86.3 percent and 70.8 percent, respectively for super resolved mixed pixels.