Hyperspectral image classification through bilayer graph-based learning.

Hyperspectral image classification with limited number of labeled pixels is a challenging task. In this paper, we propose a bilayer graph-based learning framework to address this problem. For graph-based classification, how to establish the neighboring relationship among the pixels from the high dimensional features is the key toward a successful classification. Our graph learning algorithm contains two layers. The first-layer constructs a simple graph, where each vertex denotes one pixel and the edge weight encodes the similarity between two pixels. Unsupervised learning is then conducted to estimate the grouping relations among different pixels. These relations are subsequently fed into the second layer to form a hypergraph structure, on top of which, semisupervised transductive learning is conducted to obtain the final classification results. Our experiments on three data sets demonstrate the merits of our proposed approach, which compares favorably with state of the art.