## Hyperspectral Data Classification Algorithm Based on the Deep Belief and Self-Organizing Neural Network

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**Abstract :** In this paper, the method of combining the Pohl Seidman's deep belief network with the self-organizing neural network is proposed to classify the target. This method is mainly aimed at the high nonlinearity of the hyperspectral image, the high sample dimension and the difficulty in designing the classifier. The main feature of original data is extracted by deep belief network. In the process of extracting features, adding known labels samples to fine tune the network, enriching the main characteristics. Then, the extracted feature vectors are classified into the self-organizing neural network. This method can effectively reduce the dimensions of data in the spectrum dimension in the preservation of large amounts of raw data information, to solve the traditional clustering and the long training time when labeled samples less deep learning algorithm for training problems, improve the classification accuracy and robustness. Through the data simulation, the results show that the proposed network structure can get a higher classification precision in the case of a small number of known label samples. **Keywords :** DBN, SOM, pattern classification, hyperspectral, data compression

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