

عنوان مقاله:

Graph Based Feature Selection Using Symmetrical Uncertainty in Microarray Dataset

محل انتشار:

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خلاصه مقاله:

Microarray data using small samples and thousands of genes provides a difficult challenge for researchers. Utilizing gene selection helps to select the most relevant genes from original dataset with the purpose of dimensionality reduction of microarray data as well as increasing the prediction performance. In this paper, a new gene selection method based on community detection technique and ranking the best genes, is proposed. In order to select the best genes, Symmetric Uncertainty calculates the similarity between two genes, and between gene and its class label. In the first phase, this leads to representation of search space in form of graph. In the second phase, the proposed graph is divided into several clusters, using community detection algorithm. Finally, after ranking the genes, the ones with maximum ranks are selected as the best genes. This approach is a supervised/unsupervised filter-based gene selection method, which not only minimizes the redundancy between genes, but also maximizes the relevance of genes and their class labels. Performance of the proposed method is compared with twelve well-known unsupervised/supervised gene selection approaches over twelve microarray datasets using four classifiers including SVM, DT, NB and k-NN. The results illustrate the advantages of the proposed approach.

کلمات کلیدی:

Gene selection; Microarray data; Filter method; Graph-based clustering; Feature Selection

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