

软件、算法与仿真

基于Markov blanket和互信息的集成特征选择算法

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摘要:

针对大量无关和冗余特征的存在可能降低分类器性能的问题, 提出一种基于近似Markov blanket和动态互信息的特征选择算法并将其应用于集成学习, 进而得到一种集成特征选择算法。该集成特征选择算法运用Bagging方法结合提出的特征选择方法生成基分类器, 并引入基分类器差异度进行选择集成, 最后用加权投票法融合所选基分类器的识别结果。通过仿真实验验证算法的有效性, 以支持向量机(support vector machine, SVM)为分类器, 在公共数据集UCI上进行试验, 并与单SVM及经典的Bagging集成算法和特征Bagging集成算法进行对比。实验结果显示, 该方法可获得较高的分类精度。

关键词: 特征选择 集成 Markov blanket 互信息

Ensemble feature selection algorithm based on Markov blanket and mutual information

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Abstract:

To resolve the poor performance of classifiers owing to the irrelevant and redundancy features, a feature selection algorithm based on approximate Markov blanket and dynamic mutual information is proposed, then it is introduced to an ensemble feature selection algorithm. In the ensemble algorithm, a base classifier is trained based on Bagging and the proposed feature selection algorithm, and the base classifier diversity is introduced to selective ensemble. Finally, the weighted voting method is utilized to fuse the base classifiers' recognition results. To attest the validity, experiments on data sets with support vector machine (SVM) as the classifier are carried out. The results have been compared with single SVM, Bagging SVM and AB SVM. Experimental results suggest that the proposed algorithm can get higher classification accuracy.

Keywords: feature selection ensemble Markov blanket mutual information

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