Exploiting Label Relationship in Multi-Label Learning

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Abstract

In many real data mining tasks, one data object is often associated with multiple class labels simultaneously; for example, a document may belong to multiple topics, an image can be tagged with multiple terms, etc. Multi-label learning focuses on such problems, and it is well accepted that the exploitation of relationship among labels is crucial; actually this is the essential difference between multi-label learning and conventional (single-label) supervised learning.

Most multi-label learning approaches try to capture label relationship and then apply it to help construct prediction models. Some approaches rely on external knowledge resources such as label hierarchies, and some approaches try to exploit label relationship by counting the label co-occurrences in training data. These approaches are effective in many cases; however, in real practice, the external label relationship is often unavailable, and generating label relationship from training data and then applying to the same training data for model construction will greatly increase the overfitting risk. Moreover, the label relationship is usually assumed symmetric, and almost all existing approaches exploit it globally by assuming the label correlation be shared among all instances.

Short Bio

Zhi-Hua Zhou is a professor at Nanjing University. His research interests are mainly in machine learning, data mining, pattern recognition and multimedia information retrieval. In these areas he has published more than 100 papers in leading international journals or conferences, and holds 12 patents. He is the recipient of the IEEE CIS Outstanding Early Career Award, the Fok Ying Tung Young Professorship Award, the Microsoft Young Professorship Award,

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