

Classifier chains for multi-label classification

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Abstract The widely known binary relevance method for multi-label classification, which considers each label as an independent binary problem, has often been overlooked in the literature due to the perceived inadequacy of not directly modelling label correlations. Most current methods invest considerable complexity to model interdependencies between labels. This paper shows that binary relevance-based methods have much to offer, and that high predictive performance can be obtained without impeding scalability to large datasets. We exemplify this with a novel classifier chains method that can model label correlations while maintaining acceptable computational complexity. We extend this approach further in an ensemble framework. An extensive empirical evaluation covers a broad range of multi-label datasets with a variety of evaluation metrics. The results illustrate the competitiveness of the chaining method against related and state-of-the-art methods, both in terms of predictive performance and time complexity.

Keywords Multi-label classification · Problem transformation · Ensemble methods · Scalable methods

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