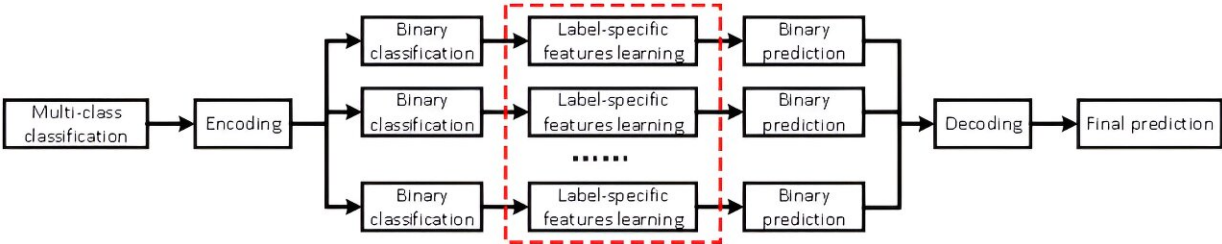# Learning label-specific features for decomposition-based multi-class classification

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Credit: *Frontiers of Computer Science* (2023). DOI: 10.1007/s11704-023-3076-y

Multi-class classification can be solved by decomposing it into a set of binary classification problems according to some encoding rules. Existing works solve these binary classification problems in the original feature space, while it might be suboptimal as different binary classification problems correspond to different positive and negative examples.

To deal with this problem, a research team led by Min-Ling Zang published their research in *Frontiers of Computer Science*.

The team proposed to learn label-specific features for each decomposed binary classification problem to consider the specific characteristics

containing in its positive and negative examples. Experiments clearly validate the effectiveness of learning label-specific features for decomposition-based multi-class classification.

In the research, for each decomposed binary classification problem, they respectively perform clustering analysis on its positive examples and negative examples to discover the inherent characteristics residing in this specific classification problem. Based on the clustering results, the label-specific features for each example are constructed by measuring the similarity between the example and all cluster centers. Experiments show the superiority of learning binary classifiers based on the generated label-specific features against the original features.

Future work can focus on exploring other feasible techniques to obtain label-specific features (e.g., feature selection) and further utilizing the specific information residing in different decomposition strategies.