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A Meta-Top-Down Method for Large-Scale Hierarchical Classification

Abstract:

Recent large-scale hierarchical classification tasks typically have tens of thousands of classes on which the most widely used approach to multiclass classification--one-versus-rest--becomes intractable due to computational complexity. The top-down methods are usually adopted instead, but they are less accurate because of the so-called error-propagation problem in their classifying phase. To address this problem, this paper proposes a meta-top-down method that employs metaclassification to enhance the normal top-down classifying procedure. The proposed method is first analyzed theoretically on complexity and accuracy, and then applied to five real-world large-scale data sets. The experimental results indicate that the classification accuracy is largely improved, while the increased time costs are smaller than most of the existing approaches.