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Empirical bayesian binary classification forests using bootstrap prior

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Abstract

In this paper, we present a new method called Empirical Bayesian Random Forest (EBRF) for binary classification problem. The prior ingredient for the method was obtained using the bootstrap prior technique. EBRF addresses explicitly low accuracy problem in Random Forest (RF) classifier when the number of relevant input variables is relatively lower compared to the total number of input variables. The improvement was achieved by replacing the arbitrary subsample variable size with empirical Bayesian estimate. An illustration of the proposed, and existing methods was performed using five high-dimensional microarray datasets that emanated from colon, breast, lymphoma and Central Nervous System (CNS) cancer tumours. Results from the data analysis revealed that EBRF provides reasonably higher accuracy, sensitivity, specificity and Area Under Receiver Operating Characteristics Curve (AUC) than RF in most of the datasets used.

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