

A New Multiclass Generalization of AdaBoost

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Abstract: Boosting has been a very successful idea for the two-class classification problem. In going from two-class to multi-class classification, most algorithms have been restricted to reducing the multi-class classification problem to multiple two-class problems. In this talk, we propose a new algorithm that directly extends the original AdaBoost algorithm to the multi-class case without reducing it to multiple two-class problems. This algorithm differs from AdaBoost.M1 in that it only requires the performance of each weak classifier be better than random guessing rather than $1/2$. We further show that the new algorithm fits a forward stagewise additive model using a multi-class exponential loss function. Implications of this multi-class exponential loss function are also discussed.