
Algorithm 10.1 *AdaBoost.M1*.

1. Initialize the observation weights $w_i = 1/N$, $i = 1, 2, \dots, N$.
2. For $m = 1$ to M :
 - (a) Fit a classifier $G_m(x)$ to the training data using weights w_i .
 - (b) Compute

$$\text{err}_m = \frac{\sum_{i=1}^N w_i I(y_i \neq G_m(x_i))}{\sum_{i=1}^N w_i}.$$

- (c) Compute $\alpha_m = \log((1 - \text{err}_m)/\text{err}_m)$.
 - (d) Set $w_i \leftarrow w_i \cdot \exp[\alpha_m \cdot I(y_i \neq G_m(x_i))]$, $i = 1, 2, \dots, N$.
 3. Output $G(x) = \text{sign} \left[\sum_{m=1}^M \alpha_m G_m(x) \right]$.
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