Note for Pattern Recognition and Machine Learning

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1 Ensemble Learning

Algorithm 1: AdaBoost

Initialize sample weight $w_n^{(1)} = 1/N, \forall n = 1, \ldots, N$;

for $m = 1, \ldots, M$ **do**

$\quad$ Train classifier $y_m(\cdot)$ by minimizing $J_m = \sum_{n=1}^{N} w_n^{(m)} 1_{y_m(\mathbf{x}_n) \neq t_n}$

$\quad$ Compute $\epsilon_m = J_m / \sum_{n=1}^{N} w_n^{(m)}$ and $\alpha_m = \eta \log \frac{1-\epsilon_m}{\epsilon_m}$

$\quad$ Update sample weight $w_n^{(m+1)} = w_n^{(m)} \exp(\alpha_m 1_{y_m(\mathbf{x}_n) \neq t_n})$

end

The weight remains unchanged if the sample is correctly classified,