$$f(p(i)) = \log \frac{1}{p(i)} = -\log p(i) \tag{1}$$

$$E(P) = \sum_{i}^{n} \log p(i) \frac{1}{p(i)} = -\sum_{i}^{n} p(i) \log p(i) \tag{2}$$

$$E(PQ) = -\sum_{i}^{n} p(i) \log q(i) \tag{3}$$

$$crossentropy = -\sum_{i}^{n} y \log y \tag{4}$$

$$g(D, A) = E(D) - E(D|A) \tag{5}$$

$$g_R(D, A) = \frac{g(D, A)}{E(D)} \tag{6}$$

ϵ $p_i C_i$ $A_k A_k A_k a_i$ $N_t N_{tk} E_t(T) \alpha$

$$L = \sum_{t=1}^{|T|} N_t E_t(T) + \alpha |T| \tag{7}$$

$Gini(D, A) =$ $\frac{|D_1|}{|D|} Gini(D_1) +$ $\frac{|D_2|}{|D|} Gini(D_2)$ $sign(wx +$ $b)$ $wx +$ $b =$ $0 | wx +$ $b | wx +$ $by(wx +$ $b)$

$$\hat{\gamma}_i = y_i(wx_i + b) \tag{8}$$

$\|w\| =$ 1 $wx +$ $b =$ $0 (x_i, y_i)$

$$\gamma_i = y_i(\frac{w}{\|w\|}) x_i + \frac{b}{\|w\|} \tag{9}$$

$\gamma =$ $\min \gamma_i \gamma \gamma_i$ $\|w\| =$ 1

$$\gamma = \frac{\hat{\gamma}}{\|w\|} \tag{10}$$

γ

$$\max_{w,b} \gamma \tag{11}$$

$$s.t. y_i(\frac{w}{\|w\|} x_i + \frac{b}{\|w\|}) \geq \gamma \tag{12}$$

$\boldsymbol{w_i} = \boldsymbol{w\alpha}$ $\frac{\mathbf{1}}{=} \boldsymbol{i} =$