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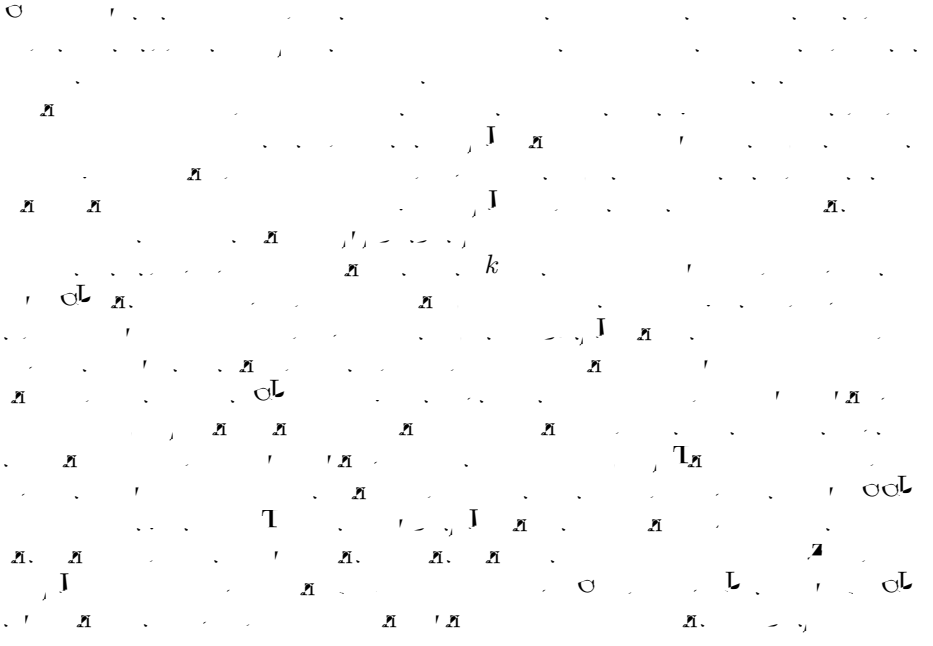
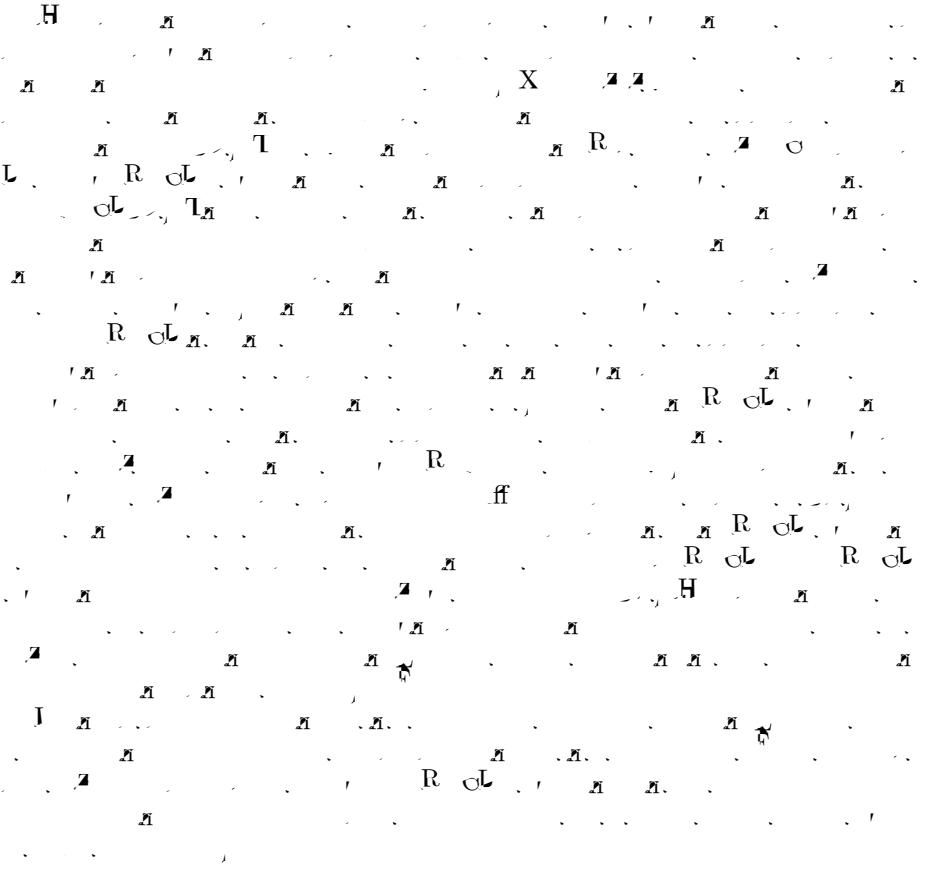
Abstract.

I



J. Wang et al. (Eds.): ISNN 2006, LNCS 3971, pp. 442–447, 2006.



a **P**

$\mathcal{S}$ $\{X^\mu\}_{\mu=1}^{N}$ X^μ $x_1^\mu, x_2^\mu, \cdots, x_d^\mu{}^T \in \mathbb{R}^d$

k

$$E_{MSE}\ \mathbf{W} \quad -\sum_{ij\mu} M_i^\mu\ x_j^\mu - w_{ij}\ ^2 \quad -\sum_{\mu} \parallel X^\mu - W_{c(\mu)} \parallel^2$$

$\mathbf{W}$ $W_1, W_2, \cdots, W_k$ W_i $w_{i1}, w_{i2}, \cdots, w_{id}{}^T \in \mathbb{R}^d$ i

$$M_i^\mu \quad \begin{cases} i \quad c\ \mu \\ \end{cases} \quad \parallel X^\mu - W_{c(\mu)} \parallel \quad {}_j \parallel X^\mu - W_j \parallel$$

$c\ \mu$ μ^{th}

$E_{MSE}\ \mathbf{W}$ k

$$E\ \mathbf{W} \quad E_1\ \mathbf{W} \quad E_2\ \mathbf{W}$$

$$E_1\ \mathbf{W} = -\sum_{\mu} \| X^{\mu} - W_{c(\mu)} \|^2, \quad E_2\ \mathbf{W} \quad \overline{P} \sum_{\mu, i \neq c(\mu)} \| X^{\mu} - W_i \|^{-P},$$

$\mathbf{W}$ $vec\, W_1, W_2, \cdots, W_n$ P E_1 E_2 E_2 E_1

$\| W_i - X^{\mu} \|$

$$\| X^{\mu} - W_i \|^2 \quad X^{\mu} - W_i\ ^T \Sigma_i^{-1}\ X^{\mu} - W_i\ ,$$

Σ_i i $W_1, \Sigma_1\ , \cdots,\ W_n, \Sigma_n$

E W_j

$$\frac{\partial E}{\partial W_j} \quad - \sum_{\mu} \delta^j_{c(\mu)} \Sigma_j^{-1}\ X^{\mu} - W_j$$

$$\sum_{\mu, j} \quad - \delta^j_{c(\mu)}\ ||X^{\mu} - W_j||^{-P-2} \Sigma_j^{-1}\ X^{\mu} - W_j$$

δ^i_j

$$W_j^{(t)} \quad W_j^{(t-1)} \quad \triangle W_j,$$

$\triangle W_j \quad -\eta \frac{\partial E}{\partial W}$ $\eta >$

$$\frac{\partial E_1}{\partial W_j} \quad \begin{cases} -\Sigma_j^{-1}\ X^\mu - W_j\ , & j \quad c\ \mu \\ , \end{cases}$$

$$\frac{\partial E_2}{\partial W_j} \quad \begin{cases} , & j \quad c\ \mu \\ ||X^\mu - W_i||^{-P-2}\Sigma_j^{-1}\ X^\mu - W_j\ , \end{cases}$$

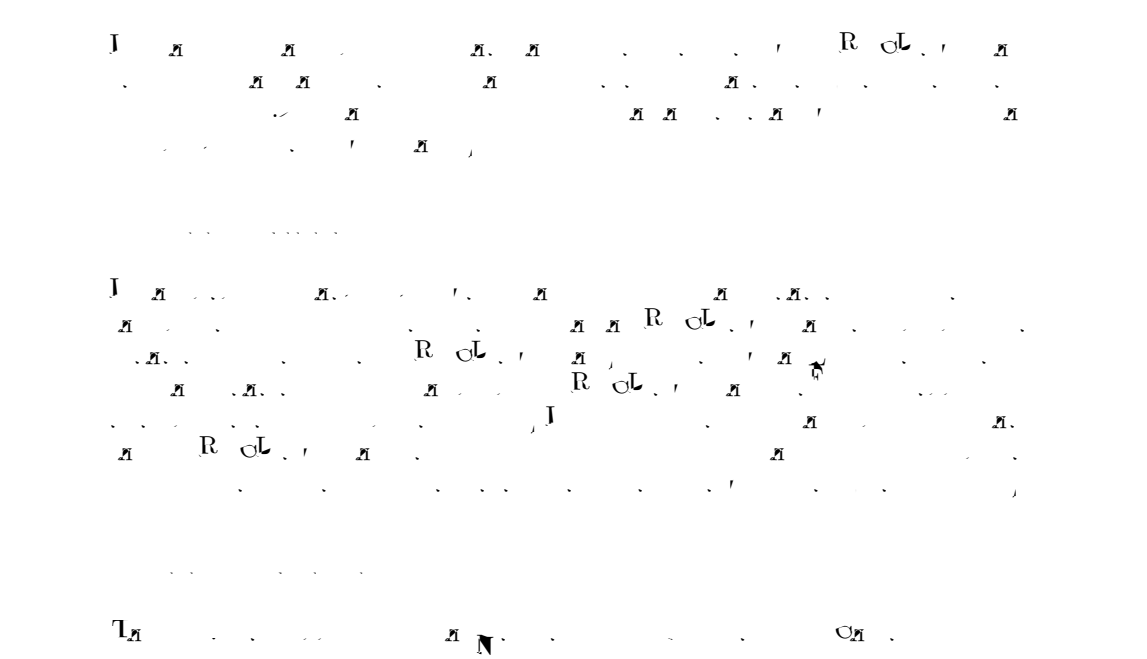
$$\Sigma_j^{(t)} \quad \begin{cases} -\eta'\ \Sigma_j^{(t-1)} \quad \eta' \sum_\mu\ X^\mu - W_{c(\mu)}\ \ X^\mu - W_{c(\mu)}\ ^T, & j \quad c\ \mu \\ \Sigma_j^{(t-1)}, \end{cases}$$

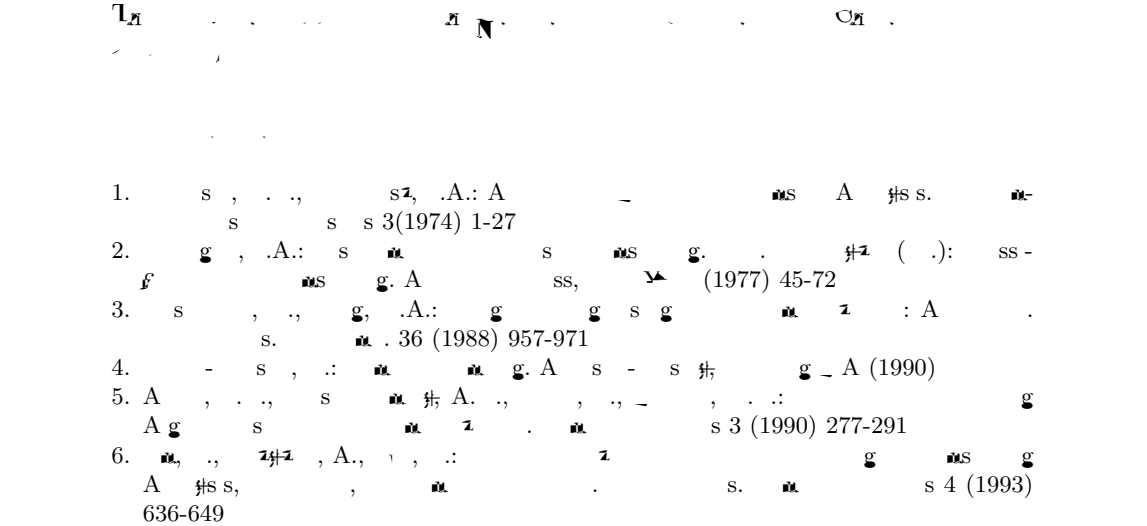
$$\Sigma_j^{(t)} \quad \begin{cases} -\eta'\ \Sigma_j^{(t-1)} \quad \eta'\ X^\mu - W_{c(\mu)}\ \ X^\mu - W_{c(\mu)}\ ^T, & j \quad c\ \mu \\ \Sigma_j^{(t-1)}, \end{cases}$$

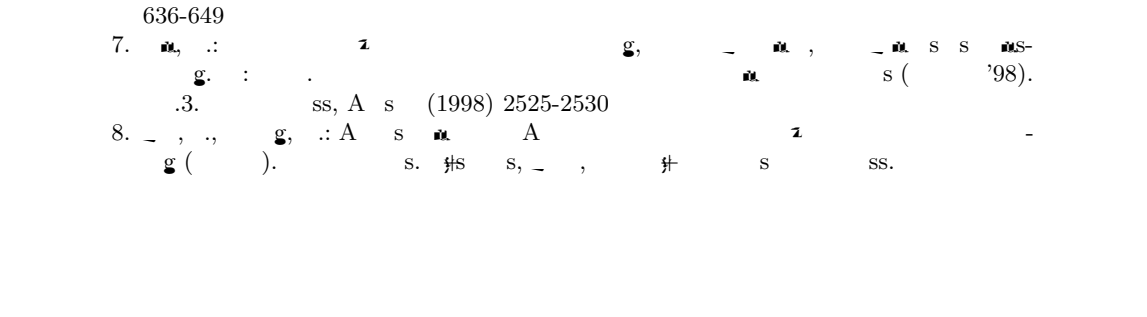
$\eta' >$

3.1 On Simulated Data Sets

d







1. s , . ., s , .A.: A s A s. s s 3(1974) 1-27
2. g , .A.: s s g. . (.): ss - f s g. A ss, (1977) 45-72
3. s , ., g, .A.: g g s g : A . s. . 36 (1988) 957-971
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