

SOM: ~~data~~ input $x: m \times n$ Weights $W: \begin{matrix} l \times m \\ l \times n \end{matrix}$ Neurons: $k \times m$

$$\underset{\downarrow}{i(x)} = \arg \min_j \|x - w_j\|$$

neuron i

$$h_{j,i(x)}(n) = \exp\left(-\frac{d_{j,i}^2}{2\sigma(n)^2}\right) \quad \sigma(n) = \sigma_0 \exp\left(-\frac{n}{\tau_1}\right), \quad \tau_i = \frac{\tau_0}{\log(\alpha_0)}$$

$$\eta = \eta_0 \exp\left(-\frac{n}{\tau_2}\right)$$

\downarrow \downarrow
0.1 N

n : iteration.
iteration

$$d_{j,i}^2 = \|x_j - x_i\|^2$$

$$w_j(n+1) = w_j(n) + \eta(n) h_{j,i(x)}(n) (x(n) - w_j(n))$$

初始化: $w_j(0)$ 随机 $j = 1, 2, \dots, l$

\downarrow
input x : ~~matrix~~ n 维.

\downarrow

$$\text{find } i(x) = \arg \min_j \|x(n) - w_j\| \rightarrow \textcircled{j}$$

$$\downarrow \text{update: } w_j(n+1) = w_j(n) + \eta(n) h_{j,i(x)}(n) (x(n) - w_j(n))$$

\downarrow
repeat — until Fixed.