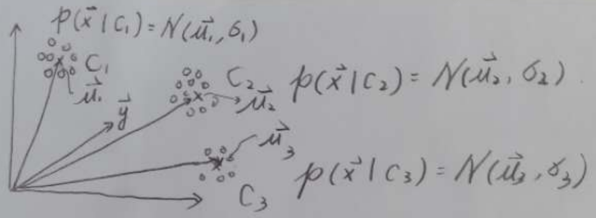
許志宇 2019.5.11



$dim(\vec{y}) = dim(\vec{\mu}_1) = dim(\vec{\mu}_2) = dim(\vec{\mu}_3)$

$\vec{y} = \alpha_1\vec{\mu}_1 + \alpha_2\vec{\mu}_2 + \alpha_3\vec{\mu}_3 = [\vec{\mu}_1\ \vec{\mu}_2\ \vec{\mu}_3]\vec{\alpha}$, $\vec{\alpha}^T = (\alpha_1, \alpha_2, \alpha_3)$

$\alpha_1 = k_1 e^{-\|\vec{y}-\vec{\mu}_1\|^2}$ $\quad \mathbb{U} = [\vec{\mu}_1\ \vec{\mu}_2\ \vec{\mu}_3]$

$\alpha_2 = k_2 e^{-\|\vec{y}-\vec{\mu}_2\|^2}$ $\quad \vec{y} = \mathbb{U}\vec{\alpha}$

$\alpha_3 = k_3 e^{-\|\vec{y}-\vec{\mu}_3\|^2}$

$\alpha_1^2 + \alpha_2^2 + \alpha_3^2 = 1$, $\|\vec{\alpha}\|_2^2 = 1$. (constraint)

$\max \mathbb{P}(C_i \mid \vec{y}) \quad i = 1, 2, 3$

$\max p(\vec{y} \mid C_i)\mathbb{P}(C_i) \quad i = 1, 2, 3$

$i=1.$ $\vec{\alpha}_1^* = \max_{\vec{\alpha}_1} p(\mathbb{U}\vec{\alpha} \mid C_1)\mathbb{P}(C_1)$, $\|\vec{\alpha}_1\| = 1$

$i=2$ $\vec{\alpha}_2^* = \max_{\vec{\alpha}_2} p(\mathbb{U}\vec{\alpha} \mid C_2)\mathbb{P}(C_2)$. $\|\vec{\alpha}_2\| = 1$

$i=3.$ $\vec{\alpha}_3^* = \max_{\vec{\alpha}_3} p(\mathbb{U}\vec{\alpha} \mid C_3)\mathbb{P}(C_3)$, $\|\vec{\alpha}_3\| = 1$.

discussion:

① $\vec{y} = \vec{\mu}_1$ $\quad \vec{\alpha}_1^* = \begin{bmatrix}1\\0\\0\end{bmatrix}$, $\quad \vec{\alpha}_2^* = \begin{bmatrix}?\end{bmatrix}$ $\quad \vec{\alpha}_3^* = \begin{bmatrix}?\end{bmatrix}$.

② $\vec{y} = \vec{\mu}_2$ $\quad \vec{\alpha}_1^* = \begin{bmatrix}?\end{bmatrix}$ $\quad \vec{\alpha}_2^* = \begin{bmatrix}0\\1\\0\end{bmatrix}$ $\quad \vec{\alpha}_3^* = \begin{bmatrix}?\end{bmatrix}$

③ $\vec{y} = \vec{\mu}_3$ $\quad \vec{\alpha}_1^* = \begin{bmatrix}?\end{bmatrix}$ $\quad \vec{\alpha}_2^* = \begin{bmatrix}?\end{bmatrix}$ $\quad \vec{\alpha}_3^* = \begin{bmatrix}0\\0\\1\end{bmatrix}$