U19CS009

Brijesh Rohit

Q- 3D GMM is a decision classifier in which each class is a gaussian distribution. In GMM, it is assumed the probability distribution of observed parameters takes below parametric form.

$$p(x) = \sum_{i=1}^{m} \alpha_i \cdot N(x, \mu_i, \Sigma_i)$$

$$\downarrow$$

$$\frac{1}{\sqrt{2\pi^p \Sigma}} e^{\frac{1}{2}(x-\mu)^T \Sigma^{-1} (x-\mu)}$$

$m \rightarrow$ number of mixture models

$\alpha \rightarrow$ weighing factor prior probability.

$$\alpha_i \geq 1$$

input vector x_p is independent.

$$P\left(\frac{c_i}{x}\right) = \frac{\alpha(N(x, \mu_i, \Sigma_i))}{\sum_{j=i}^{m} \alpha_j N(x_j, \mu_j, \Sigma_j)}$$

$\alpha, \mu, \Sigma \rightarrow$ can be estimated with the expectation maximization algorithm, which is unsupervised learning.