

The estimates of the covariance matrices and the feature mean vectors from the data are substituted for the parameters. The posterior probability is computed as

$$p(c_i | \mathbf{x}_0) = \frac{P(c_i) e^{-1/2 D_i^2}}{\sum_j P(c_j) e^{-1/2 D_j^2}} \quad (7.29)$$

where $D_j^2 = (\mathbf{x}_0 - \bar{\mathbf{x}}_j)^T S_j^{-1} (\mathbf{x}_0 - \bar{\mathbf{x}}_j) + \ln |S_j|$.