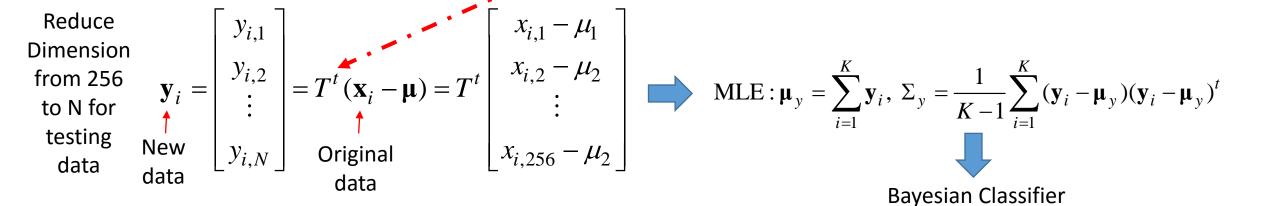
Training Data =  $\{\mathbf{x}_i\}_{i=1}^K$ 

Find eigenvectors of 
$$\Sigma$$

$$\Sigma = \sum_{k=1}^K \mathbf{x}_k \longrightarrow \Sigma = \sum_{k=1}^K (\mathbf{x}_k - \mathbf{\mu})(\mathbf{x}_k - \mathbf{\mu})^t \longrightarrow \text{Find eigenvectors of } \Sigma$$
Sort eigenvalues according to the descending order of eigenvalues
$$Choose \text{ the first N}$$
eigenvectors
$$\mathbf{e}_1, \mathbf{e}_2, \dots, \mathbf{e}_N$$

$$T = \begin{bmatrix} e_{1,1} & e_{2,1} & \cdots & e_{N,1} \\ e_{1,2} & e_{2,2} & \cdots & e_{N,2} \\ \vdots & \vdots & \ddots & \vdots \\ \vdots & \vdots & \ddots & \vdots \\ \end{bmatrix}$$



 $\mathbf{e}_1$ 

 $\mathbf{e}_2$ 

 $\mathbf{e}_N$