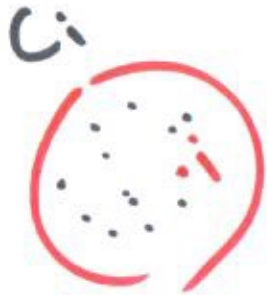# Silhouette Coefficient

c_j

c_i

$$a(i) = \frac{1}{|c_i| - 1} \sum_{\substack{j \in c_i \\ j \neq i}} d(i, j)$$

$$a(i) = \frac{1}{|c_i| - 1} \sum_{\substack{j \in c_i \\ j \neq i}} d(i, j)$$

$$b(i) = \min_{j \neq i} \frac{1}{|c_j|} \sum_{j \in c_j} d(i, j)$$

$$
S(i) = \begin{cases} 1 - \dfrac{a(i)}{b(i)} & \text{if} \quad a(i) < b(i) \\[4mm] 0 & \text{if} \quad a(i) = b(i) \\[4mm] \dfrac{b(i)}{a(i)} - 1 & \text{if} \quad b(i) < a(i) \end{cases}
$$