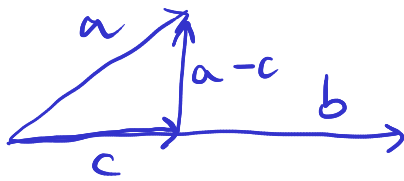


510

$$c = \lambda b \quad (\lambda \in \mathbb{R})$$



$$\begin{aligned} \|a-c\|^2 &= (a-c) \circ (a-c) = (a-\lambda b) \circ (a-\lambda b) \\ &= \underbrace{(a \circ a)}_{=\|a\|^2} + \underbrace{(-\lambda b \circ a)}_{=-\lambda(a \circ b)} + \underbrace{(a \circ (-\lambda b))}_{=-\lambda(a \circ b)} + \underbrace{(-\lambda b \circ (-\lambda b))}_{=\lambda^2 \|b\|^2} \end{aligned}$$

$$= \|a\|^2 - 2\lambda(a \circ b) + \lambda^2 \|b\|^2$$

$$= \|b\|^2 \left(\lambda^2 - 2\lambda \frac{a \circ b}{\|b\|^2} + \frac{\|a\|^2}{\|b\|^2} \right)$$

$$= \|b\|^2 \left(\left(\lambda - \frac{a \circ b}{\|b\|^2} \right)^2 - \left(\frac{a \circ b}{\|b\|^2} \right)^2 + \frac{\|a\|^2}{\|b\|^2} \right)$$

also Minimum bei $\lambda = \frac{a \circ b}{\|b\|^2}$,

$$\text{somit } c = \lambda b = \frac{a \circ b}{\|b\|^2} b = \underline{\underline{\left(a \circ \frac{b}{\|b\|} \right) \frac{b}{\|b\|}}}$$