

厦 門 大 學



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2-2

$$R(w) = \frac{1}{2} \sum_{n=1}^N (\sqrt{r^{(n)}} (y^{(n)} - w^T x^{(n)}))^2$$

$$= \frac{1}{2} \| \sqrt{R}^T (Y - X^T w) \|^2$$

$$\frac{\partial R(w)}{\partial w} = -X \sqrt{R} \sqrt{R}^T (Y - X^T w) = 0$$

$$X \sqrt{R} \sqrt{R}^T X^T w = X \sqrt{R} \sqrt{R}^T Y$$

$$w^* = (X \sqrt{R} \sqrt{R}^T X^T)^{-1} X \sqrt{R} \sqrt{R}^T Y$$

权重 $r^{(n)}$ 越大, 表明它对结果的影响性就越大.

2-4 $R(w) = \frac{1}{2} \| y - X^T w \|^2 + \frac{1}{2} \lambda \| w \|^2$

$$w^* = (X X^T + \lambda I)^{-1} X y$$

$$\frac{\partial R(w)}{\partial w} = 0$$

$$-X(y - X^T w) + \lambda w = 0$$

$$-X y + X X^T w + \lambda w = 0$$

$$(X X^T + \lambda) w = X y$$

$$w^* = (X X^T + \lambda)^{-1} X y$$

