

1.1 在線性迴歸中，可以把 basis function $\phi(x)$ 當成“特徵偵測器”其性質具有一些簡單分析性質。常見 basis function 有

$$\phi_j(x) = \exp\left\{-\frac{(x-m_j)^2}{2s^2}\right\}$$

② sigmoid function

$$\phi_j(x) = f\left(\frac{x-m_j}{s}\right)$$

1.2 predict t for a new value of x using

$$p(t|x, \mathbf{X}, \mathbf{t}) = \int_{-\infty}^{\infty} p(t|w) p(w|x, t) dw$$

with explicit dependence on prior parameter α , noise parameter β and target in training set \mathbf{t}

$$p(t|x, \alpha, \beta) = \underbrace{\int p(t|w, \beta) p(w|t, \alpha, \beta) dw}_{\text{Conditional of target } t \text{ given weight } w} \underbrace{p(w|t)}_{\text{posterior of weight } w}$$

$p(t|x, w, \beta) = N(t | \gamma(x, w), \beta^{-1})$

$$p(w|t) = N(w | m_N, S_N)$$

$$\text{where: } m_N = \beta S_N \phi^T t$$

$$S_N^{-1} = \alpha I + B \phi^T \phi$$

RHS is a convolution of two Gaussian distributions

whose result is the Gaussian

$$p(t|x, t) = N(t | m(x), s^2(x))$$

Date :

1.3 = The objective of linear regression model is to find relationship between the input variables and a target variable. If you use regression model to fit classification problem; you should have two problem.

and

1- predicted value is continuous not probabilistic

2- sensitive to imblance data

i-a =

Maximum likelihood =

To predict that this will result in a success.