Brief Article

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1 3.1

$$2\sigma(2a) - 1 = \frac{2}{1 + \exp(-2a)} - 1 \tag{1}$$

$$= \frac{1 - exp(-2a)}{1 + exp(-2a)} \tag{2}$$

$$= \tanh(a) \tag{3}$$

Replacing all $\tanh(\cdot)$ with the equation above, we have

$$y(x|\boldsymbol{u}) = u_0 - \sum_{j=1}^{M} u_j + \sum_{j=1}^{M} 2u_j\sigma(\frac{x - \mu_j}{s}) \tag{4}$$

$w_0 = u_0 - \sum_{j=1}^{M} u_j, w_i = 2u_i$.

2 3.2

Trivial... But the equation in the manual deserves studying... I think it's better to first list $\boldsymbol{\Phi}^T(\boldsymbol{\Phi\beta} - \boldsymbol{t}) = \mathbf{0}$ and solve it.

3 3.3

Trivial... Interpretation one: different variance for different data points; two: effective number of data points.

4 3·4

Trivial... But I think $E_D(\boldsymbol{w})$ should be divided by N, so that there won't be a N before the regularization term.

5 3·5

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