

β, α HYPER PARAMETERS
ESTIMATED FROM DATA

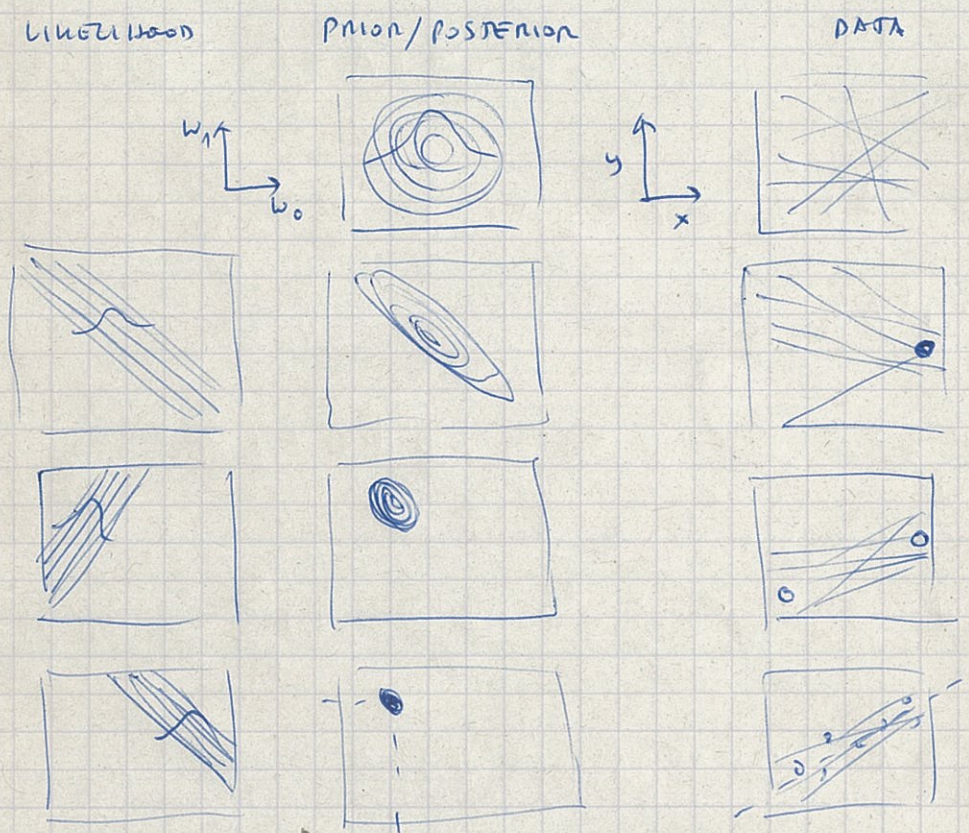
$$\alpha = \frac{\gamma}{\underline{m}_N^T \underline{m}_N}$$

$$\gamma = \sum \frac{\lambda_i}{\lambda + \lambda_i}$$

$$\lambda_i: \text{ITH EIGENVALUE OF } \underline{\beta} \underline{\Phi}^T \underline{\Phi}$$

$$\beta = \frac{1}{N - \delta} \sum_{n=1}^N (\underline{t}_n - \underline{m}_N^T \cdot \underline{\Phi}(\underline{x}_n))^2$$

(BISHOP 3.3, FIG. 3.7)



PREDICTIVE DISTRIBUTION

$p(\underline{t} | \underline{D}, \alpha, \beta)$
FOR NEW X VALUES

$$p(\underline{t} | \underline{t}, \alpha, \beta) = \int \underbrace{p(\underline{t} | \underline{w}, \beta)}_{\text{LIKELIHOOD}} \underbrace{p(\underline{w} | \underline{t}, \alpha, \beta)}_{\text{POSTERIOR}} d\underline{w}$$