

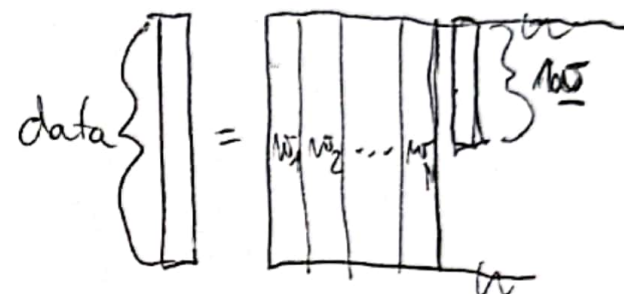
$$\hat{y} = \sum_{i=1}^M \underline{w}_i^T \underline{x} \phi_i(\underline{z}) = \square \begin{matrix} 1 \\ 2 \\ \vdots \\ M \end{matrix} \begin{matrix} \hat{\theta}^1 \\ \hat{\theta}^2 \\ \vdots \\ \hat{\theta}^M \end{matrix} + \dots + \square \begin{matrix} \hat{\theta}^M \end{matrix}$$

(i)

$$\hat{y} = \underline{X} \underline{w}$$

↑  
value

$$\underline{X} = [\underline{X}_1 \dots \underline{X}_M] \dots \begin{matrix} \text{regression} \\ \text{matrix} \end{matrix}$$



$$\underline{X}_i = \begin{bmatrix} \begin{matrix} 1 \\ 1 \\ \vdots \\ 1 \end{matrix} & \begin{matrix} \underline{u}(k) \\ \vdots \\ \underline{u}(k-p) \end{matrix} & \dots & \begin{matrix} \underline{y}(k-1) \\ \vdots \\ \underline{y}(k-p) \end{matrix} \end{bmatrix} \Phi_i(\underline{z})$$

$$\begin{cases} \text{NOE} : \hat{y}(k) \\ \text{NARX} : \underline{y}(k) \end{cases}$$

$$\hat{y} = \underline{X} \underline{w} \Rightarrow \underline{w} = \underline{X}^+ \hat{y} ; \underline{X}^+ = \dots \text{pinv}$$