

$$\underbrace{\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix}}_{\dot{x}} = \underbrace{\begin{bmatrix} 1 & x_1 & x_2 & x_3 & x_1x_2 & x_1^2 & x_1x_3 & \cdots & x_3^2 \end{bmatrix}}_{\phi(x)} \underbrace{\begin{bmatrix} \beta^1 & \beta^2 & \beta^3 \end{bmatrix}}_{\beta} + \varepsilon$$

The diagram illustrates a polynomial expansion of a vector field. The vector field  $\dot{x}$  is represented by three colored vertical bars (blue, red, green). This is equal to the product of a feature vector  $\phi(x)$  and a parameter vector  $\beta$ .  $\phi(x)$  is shown as a row of gray vertical bars with labels  $1, x_1, x_2, x_3, x_1x_2, x_1^2, x_1x_3, \dots, x_3^2$ .  $\beta$  is shown as three colored vertical bars (blue, red, green) with circles inside, labeled  $\beta^1, \beta^2, \beta^3$ . An error term  $+\varepsilon$  is added at the end.