A General State-Space Model

$$\text{state } x = \begin{pmatrix} x_1 \\ \vdots \\ x_n \end{pmatrix} \in \mathbb{R}^n \qquad \text{input } u = \begin{pmatrix} u_1 \\ \vdots \\ u_m \end{pmatrix} \in \mathbb{R}^m$$

$$\text{output } y = \begin{pmatrix} y_1 \\ \vdots \\ y_p \end{pmatrix} \in \mathbb{R}^p$$

$$\dot{x} = Ax + Bu$$
$$y = Cx + Du$$

where:

A – system matrix $(n \times n)$ $\qquad$ B – input matrix $(n \times m)$

C – output matrix $(p \times n)$ $\qquad$ D – feedthrough matrix $(p \times m)$