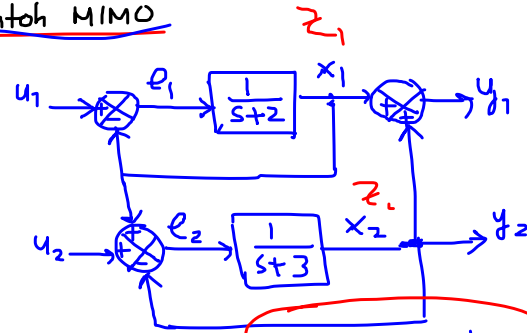


Contoh MIMO



Suatu sistem dengan susunlah model Runny Keadaannya!

$$\begin{cases} \dot{x} = Ax + Bu \\ y = Cx + Du \end{cases} \quad \begin{matrix} A [2 \times 2] & B [2 \times 2] \\ C [2 \times 2] & D [2 \times 2] \end{matrix}$$

$$\dot{x} = \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -3 & 0 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} u_1 \\ u_2 \end{bmatrix}$$

[A] [B]

$$y = \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} u_1 \\ u_2 \end{bmatrix}$$

[C] [D]

$$\begin{bmatrix} \dot{x}_1 \\ x_1 \\ \dot{x}_2 \\ x_2 \end{bmatrix} = \begin{bmatrix} \bigcirc & \bigcirc \\ -\bigcirc & \bigcirc \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} \bigcirc \\ \bigcirc \end{bmatrix}$$

$$\frac{X_1(s)}{E_1(s)} = \frac{1}{s+2}$$

kasus

$$m < n$$

$$m=0 \quad n=1$$

$$b_0 \quad a_0=2$$

$$a_1=1$$

$$\dot{x}_1 = [-2]x_1 + [1]e_1$$

$$\dot{x}_1 = -2x_1 + e_1$$

$$\dot{x}_1 = -3x_1 + u_1$$

$$\frac{X_2(s)}{E_2(s)} = \frac{1}{s+3}$$

$$\dot{x}_2 = -3x_2 + e_2$$

$$\dot{x}_2 = -3x_2 + [x_1 - x_2 + u_2]$$

$$\dot{x}_2 = -4x_2 + x_1 + u_2$$

$$\begin{bmatrix} 0 & 1 & \dots & \dots \\ 0 & 0 & 1 & \dots \\ \vdots & \vdots & \vdots & \ddots \end{bmatrix}$$

$$G_1(s) = \frac{1}{s^2 + 2s + 1} \Rightarrow \frac{Z_1(s)}{E_1(s)}$$

$$x_1, x_2$$

