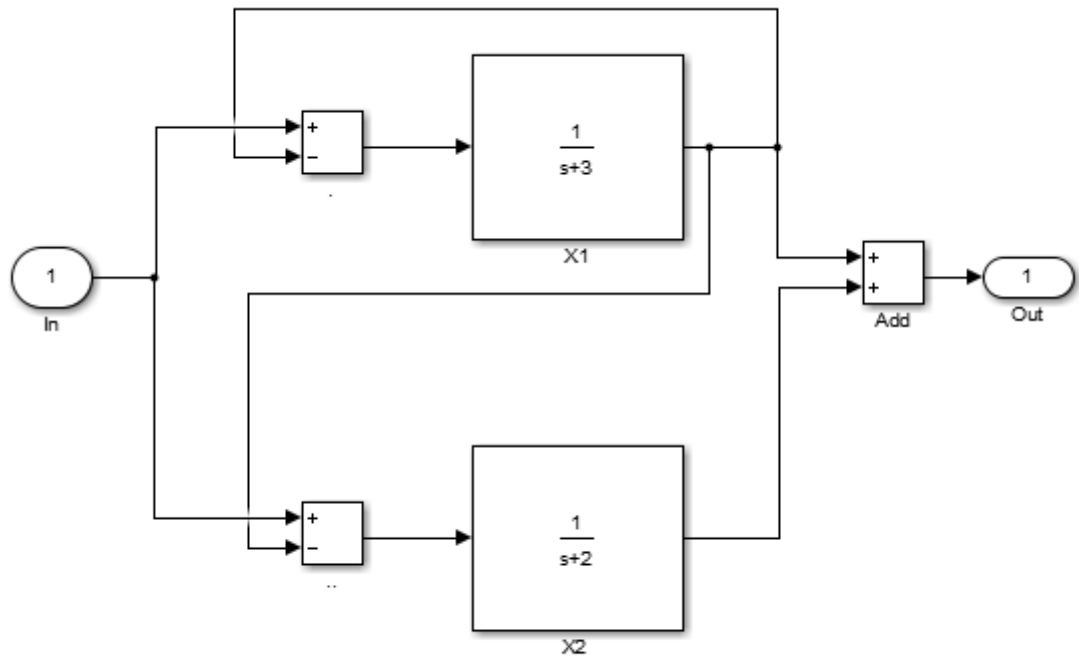


Alvaro Delgado Zumbado

Análisis de sistemas lineales



Out= y

In= u

$$y = X_1(s) + X_2(s)$$

$$X_1(s) = \frac{U(s) - X_2(s)}{s + 3}$$

$$sX_1(s) + 3X_1(s) = U(s) - X_2(s)$$

$$sX_1(s) = -3X_1(s) - X_2(s) + U(s)$$

$$X_2(s) = \frac{U(s) - X_1(s)}{s + 2}$$

$$sX_2(s) + 2X_2(s) = U(s) - X_1(s)$$

$$sX_2(s) = -X_1(s) - 2X_2(s) + U(s)$$

Sistema de ecuaciones:

$$\begin{cases} sX_1(s) = -3X_1(s) - X_2(s) + U(s) \\ sX_2(s) = -X_1(s) - 2X_2(s) + U(s) \end{cases}$$

Pasando a dominio del tiempo:

$$\begin{cases} \dot{X}_1 = -3X_1 - X_2 + U \\ \dot{X}_2 = -X_1 - 2X_2 + U \end{cases}$$

Matriz de variables de estado:

$$\dot{X} = \begin{bmatrix} -3 & -1 \\ -1 & -2 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 1 \\ 1 \end{bmatrix} * U$$

$$y = \begin{bmatrix} 1 & 1 \end{bmatrix} * \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$