0.1 Espacio de estados

Luego de hacer la linealización del sistema :

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & -\frac{3g(2m_1^2+5m_1m_2+2m_2^2)}{2(4m_0m_1+3m_0m_2+m_1m_2+m_1^2} & \frac{3gm_1m_2}{2(4m_0m_1+3m_0m_2+m_1m_2+m_1^2} & 0 & 0 & 0 \\ 0 & \frac{3g(4m_1^2+9m_1m_2+4m_0m_1+2m_2^2+8m_0m_2)}{2L_1(4m_0m_1+3m_0m_2+m_1m_2+m_1^2)} & -\frac{9*g*(2m_0m_2+m_1m_2)}{2L_1(4m_0m_1+3m_0m_2+m_1m_2+m_1^2)} & 0 & 0 & 0 \\ 0 & -\frac{9g(2m_0m_1+4m_0m_2+2m_1m_2+m_1^2)}{2L_2(4m_0m_1+3m_0m_2+m_1m_2+m_1^2)} & \frac{3g(4m_0m_1+12m_0m_2+4m_1m_2+m_1^2)}{2L_2(4m_0m_1+3m_0m_2+m_1m_2+m_1^2)} & 0 & 0 & 0 \end{bmatrix} \tag{1}$$

$$B = \begin{bmatrix} 0 \\ 0 \\ 0 \\ \frac{4m_1+3m_2}{4m_0m_1+3m_0m_2+m_1m_2+m_1^2} \\ -\frac{3(2m_1+m_2)}{L_1(4m_0m_1+3m_0m_2+m_1m_2+m_1^2)} \\ \frac{2m_2}{L_2(4m_0m_1+3m_0m_2+m_1m_2+m_1^2)} \end{bmatrix} \tag{2}$$

Si se opta por los siguientes valores:

Se obtiene:

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & -3.5757 & 0.3973 & 0 & 0 & 0 \\ 0 & 29.7973 & -13.1108 & 0 & 0 & 0 \\ 0 & -26.2216 & 22.5135 & 0 & 0 & 0 \end{bmatrix} \tag{3}$$

$$B = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0.1892 \\ -0.2432 \\ 0.036 \end{bmatrix} \tag{4}$$

0.2 Controlabilidad y Observabilidad

0.3 Realimentación de Estados

0.4 Observador

0.5 Discretización