

EXERCÍCIO DA AULA DE 01/10

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$$\begin{cases} x = (M_1 x_1 + M_2 x_2) / M \\ \ddot{x} = (U_1 + U_2) / M \end{cases}$$

$$\delta = x_1 - x_2 \quad \ddot{\delta} = -\frac{2M}{M_1 M_2} \delta + \frac{U_1}{M_1} - \frac{U_2}{M_2}$$

$$x = [x \quad \delta \quad \dot{x} \quad \dot{\delta}]^T$$

$$\begin{bmatrix} x \\ \delta \\ \dot{x} \\ \dot{\delta} \end{bmatrix} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & -\frac{2M}{M_1 M_2} & 0 & 0 \end{bmatrix} \begin{bmatrix} \dot{x} \\ \dot{\delta} \\ x \\ \delta \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ \frac{1}{M} & \frac{1}{M} \\ \frac{1}{M_1} & -\frac{1}{M_2} \end{bmatrix} \begin{bmatrix} U_1 \\ U_2 \end{bmatrix}$$