

Example: 12.21 of SD

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Problem statement

Find the matrix transfer function $H(s)$ for the state model:

$$\dot{\bar{x}} = \begin{bmatrix} 0 & 1 \\ -4 & -4 \end{bmatrix} \bar{x} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

$$\bar{y} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \bar{x} + \begin{bmatrix} 0 \\ 0 \end{bmatrix} u.$$

Also find the poles and zeros of each scalar t.f.

Solution

Applying the solution previously derived,

The (1,1)-component of $H(s)$ is the transfer function from u to y_1 , and the (2,1)-component is the transfer function from u to y_2 .

