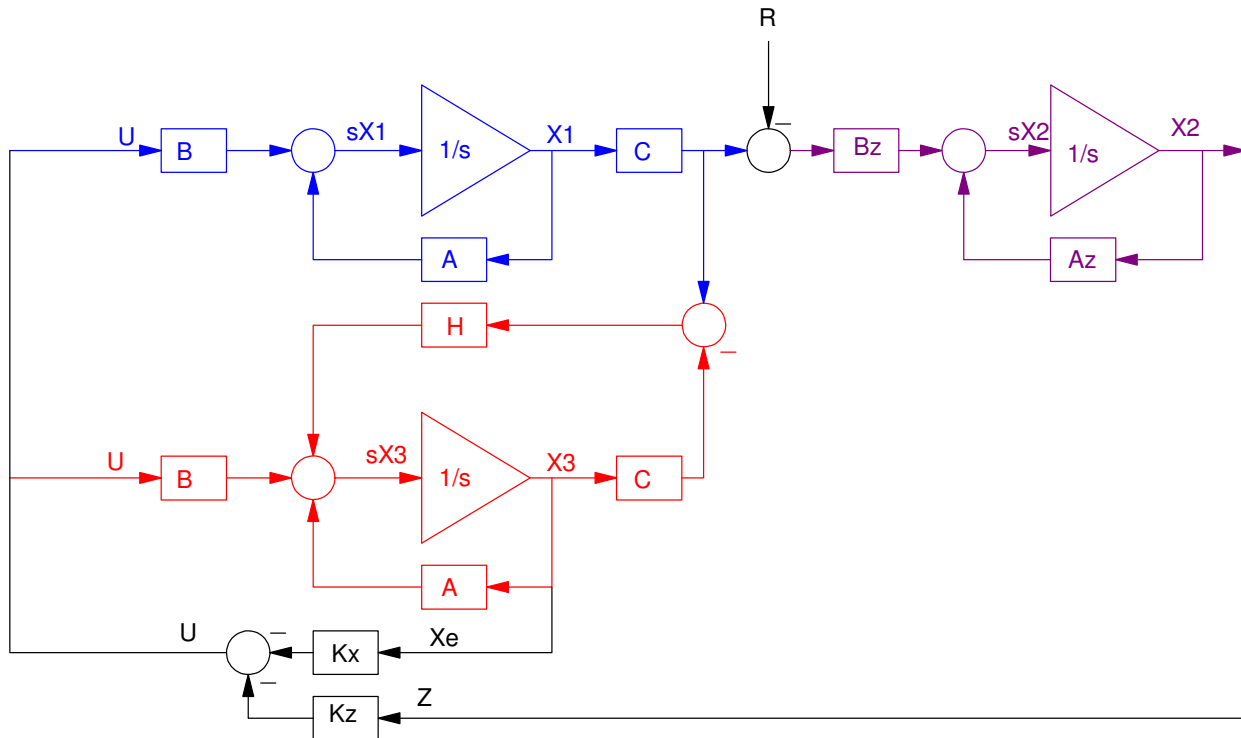


ECE 461/661 Handout #13

State Space

Express the dynamics for the following system in State Space form



State Space

ECE 461/661 - State-Space #13

Express the dynamics for the following system in State Space form

Equations:

$$sX_1 = AX_1 - BK_x X_3 - BK_z X_2$$

$$sX_2 = A_z X_2 + B_z C X_1 - B_z R$$

$$sX_3 = AX_3 - HCX_3 + HCX_1 - BK_x X_3 - BK_z X_2$$

Putting in matrix form

$$s \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} = \begin{bmatrix} A & -BK_z & -BK_x \\ B_z C & A_z & 0 \\ HC & -BK_z & A - HC - BK_x \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} + \begin{bmatrix} 0 \\ -B_z \\ 0 \end{bmatrix} R$$

