

SYS 566

System Identification

Homework 7 (Due:4/17)

Solve Problems 4.8 on pages 119 from the book *Applied System Identification* by Jer-Nan Juang. Following that:

1. use the pulse response $y(k), k = 0, \dots, 2047$, to form two 10×10 Hankel matrices, $H(0)$ and $H(1)$
2. Apply the ERA algorithm to solve for system matrices A, B, C, D
3. Use the frequency response function $G(z_k)$, to determine its inverse Fourier transform to generate the system Markov parameters (pulse response), $Y_i, i = 0, 1, \dots, 2047$
4. use the system Markov parameters $Y_k, k = 0, \dots, 2047$, to form two 10×10 Hankel matrices, $H(0)$ and $H(1)$
5. Apply the ERA algorithm to solve for the system matrices A, B, C and D.
6. Compare the eigenvalues of the state matrices A identified from the two processes above.