

ECE503 Homework Assignment Number 10

Due by 8:50pm on Monday 23-Apr-2012

IMPORTANT: Please place your ECE mailbox number on all homework assignments. Your ECE mailbox number can be found on the course web page.

Make sure your reasoning and work are clear to receive full credit for each problem. Points will be deducted for a disorderly presentation of your solution. Please also refer to the course academic honesty policies regarding collaboration on homework assignments.

1. 5 points total.
 - (a) 3 points. Analytically confirm the result in equation (12.47), i.e. calculate the matrix/vector products and apply any useful trigonometric identities to arrive at the final result in Example 12.2.
 - (b) 2 points. Numerically verify the result for a particular choice of pole locations $r = 0.9$, $\theta = \pi/4$, and coefficient quantization errors $\Delta\alpha = 0.01$ and $\Delta\beta = -0.01$. In other words, numerically compute the *exact* radial and angular displacement of the poles from the transfer function with quantized and unquantized α and β and then use equation (12.47) to compute the analytically predicted approximate displacement of the poles. Is the analytical prediction accurate?
2. 4 points. Mitra 12.2
3. 6 points. Mitra 12.6
4. 5 points. Mitra 12.10(a)
5. 5 points. Mitra 12.13(a)