ECE 6283
Homework 1

Fall 2004 Dr. Havlicek

1. Consider the Gabor filterbank we have been discussing in class (see the class handouts available on the course web site) with an image size of 256×256 pixels. For the parameter choices $r_0 = 9.6$ cycles per image (cpi) $= 0.0375$ cycles per pixel, $R = 1.8$, $B = 1.0$, and $\eta = 0.5$, complete the design for the Gabor filter with index 10 in the filterbank.

2. For this filter, show the real and imaginary parts of the impulse response as gray scale images with maximum contrast and also as mesh plots.

3. For the filter frequency response, show the real part, the imaginary part, the log-magnitude, and the phase as gray scale images with maximum contrast.

4. Apply the filter to a 256×256 floating point version of the *Lena* image. Show the real and imaginary parts of the response as gray scale images with maximum contrast.

Note: assume an image size of 256×256 throughout this assignemnt. All calculations should be done in floating point; convert to unsigned character (byte) only at the very end for display purposes.

DUE: 9/23/2004