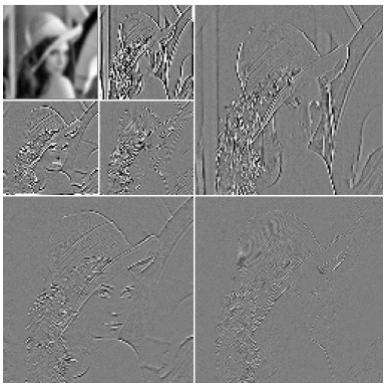
Image Processing and Computer Vision (MPHY39600/CS35600) (Kenji Suzuki)

Problem Set 10 (Due: the class after the next class)

Solutions should include relevant images and original code (written in your favorite computer language, e.g., C, C++, Matlab, IDL, etc.) of the algorithms developed, along with any discussion requested. All the images are on the Chalk website at http://chalk.uchicago.edu and in the uncompressed TIFF format. The use of a library for Wavelet transform is allowed.

1. Develop a program that transforms the image, img_lena.tif, by the Haar wavelet. Report the resulting image in a form similar to that on the right below.

original



Wavelet-transformed image

2. Consider the three detail images, obtained by applying the wavelet transform to an original image, such as the three subimages at the left bottom, right top, and right bottom corner of the wavelet-transformed image shown above. Explain why these three images enhance (or extract) the horizontal, vertical, and diagonal edges in the original image.