

Image (and Video) Coding and Processing  
Computer Project 1, Due Date: March 1, 2006  
Spring 2006

**Project Description**

In this project, your team of three (the entire class) will study the effects of quantization on image representation. In particular, you are to look into the following quantizers by implementing them (in MATLAB) and applying them to a test image:

1. Uniform Scalar Quantizer
2. A Scalar Compander Quantizer (Note: the design of the compander transformation is similar to the techniques used in histogram equalization)
3. Lloyds-Max Scalar Quantizer
4. Lattice Vector Quantizer
5. Lloyds-Max Vector Quantizer

In studying these and their performance, you should compare bits-per-pixel (i.e. code rate) versus MSE (it might be advantageous to report the results in log-scale). Additionally, note, that it will be necessary to train several of these algorithms before applying them to the test image. You should try to find your own training images.

**The Test Image**

The test image that I am providing is the standard 'Lena' test image. I am providing an uncompressed TIFF formatted version of the file at the following webpage:

[http://www.winlab.rutgers.edu/~trappe/Courses/ImageVideoS06/lena\\_uncomp.tif](http://www.winlab.rutgers.edu/~trappe/Courses/ImageVideoS06/lena_uncomp.tif)

**What to Turn In**

Collectively, your team should write up a report that summarizes your experiences, and observations. In particular, you should report the bpp-vs-MSE curves, and evaluate your observations (why is one curve better than another, or are there crossing points that are of interest?). Please inform me about what data you used to train your quantizers.