EE7790 Special Topics
VISUAL SIGNAL PROCESSING AND COMMUNICATIONS

SP11

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Project

Phase II: Baseline Image Encoding Decoding System using DCT

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Objective:
Implement a baseline image encoding and decoding system with DCT.

Steps to implement:
This week

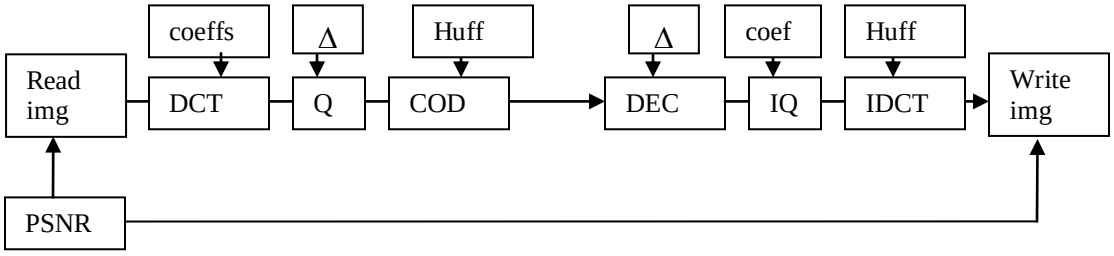
1. Write functions to read and write image data. Images are posted on http://www.lmvicente.com/ee7790/images.zip
2. Write a function to measure PSNR between two images. The images are stored in files or in the memory.

Next weeks

3. Write functions for DCT and IDCT at block and image levels.
4. Write functions for Quantization and inverse quantization at block and image levels.
5. Training:
   a. DC: 10-bit binary representation. (No prediction!)
   b. AC: (run, size) + magnitude representation. Run: [0 15], size: [0 10].
   c. Collect statistics on (run, size), and design a Huffman code table
6. Encoding: look up the Huffman table; count the number of bits of encoding.
7. Plot the rate-distortion curve by varying the quantization step size.

Methodology

The complete system diagram implemented in this project is the following:



You should work the system diagram by parts:

1. Read and write blocks.
2. PSNR block
3. DCT/IDCT blocks
4. Quantization/Inverse Quantization blocks
5. Image Coding/Image Decoding blocks