

Digital Image Compression Final Project

Undergraduate Students Version

Spring 2020

Due May 12, 11:00am

Objective: develop a DCT-based image compression system.

The system will have the following modules:

Encoder:

1. 8*8 DCT transform of the image (to be implemented by yourself);
2. Uniform quantization;
3. Zig-zag scan (use a table) and run-level coding;
4. Size + amplitude representation of the non-zero coefficients;
5. Use Huffman coder (to be provided by MATLAB) to encode run-size sequence; Do binary representation of the amplitude.
6. Calculate the bit rate of the compressed image.

Decoder:

1. Inverse quantization;
2. Inverse run-level coding and zig-zag scan.
3. Inverse DCT;
4. Compute the PSNR of the reconstructed image;

Submission:

1. A 3-5 page report to summarize the implementation with PSNR-rate curves for 3 test images;
2. Demo the encoder and decoder on the due day.
3. Email the source code and report in a zipped package before the demo.