University Kasdi Merbah - Ouargla

Faculty of New Technology of Information and Communication

Department of computer science

Module: TIVO

Lab Sheet 1

The current lab aims at programming the well-known JPEG steps. Hereafter the required operations are listed

1. Select an image from your drive, we denote this image by *I* (gray-scale image)
2. Generate the DCT bases functions and display them.
3. Divide *I* into 8x8 blocks, and calculate the DCT matrix of *I* ?
4. Apply the quantization matrix Q50 on the DCT matrix of *I* ?
5. Generate the reconstructed image and display it by applying the inverse DCT, and by keeping 30%, 50% and 70% from the energy of the quantized DCT matrix?
6. Apply the zig-zag ordering to vectorize the DCT quantized matrix?
7. Encode the DC and AC coefficients of the resulting matrix using DPCM and run-length encoding, respectively?
8. Encode the encoded AC and DC coefficients using Huffman encoding?
9. Calculate the number of bits required to store the bit stream produced by last step and compare it with the number of bits required to store the initial image?