

Communications and Computer Engineering

Using the DCT Transform

Download the lena.bmp monochrome file 512x512.

- (a) In Matlab use *imread* to port the bmp file to a 512 x 512 numeric array.
 - (b) Subdivide the 512 x 512 array into subarrays of 16 x 16 in a proper way. There should be 1024 subarrays.
 - (c) Perform a DCT on each 16x16 subarray.
 - (d) Remove from the DCT any element whose magnitude is less than 3, substituting it with 0.
 - (e) Estimate the number of zeroes inserted as a percentage of the total elements, averaging over the whole picture.
 - (f) Use the inverse dct, IDCT, on the approximated DCT arrays to recombine the submatrices, and eventually the overall picture array.
 - (g) Restore picture with *imwrite* to a .bmp file.
2. Repeat (c) to (g) LEAVING ONLY the first row from each submatrix, putting every other row element to 0.
 3. Repeat using only the first two rows from each DCT with the rest of the elements forced to 0.