



( 1 )

# Utilizing Repeated Adjacencies of Vector Quantization Indices in Image Compression

M.F. Abdel-Latif, T.K. Abdel-Hamid, M.M. Doss and H. Selim

## Abstract:

Image compression using vector quantization (VQ) results in highly correlated indices. The correlation between these indices is used to reduce the bits needed to represent them. This is done by many index compression algorithms such as the Hu and Chang, search order coding (SOC), and switching tree coding (STC). A new algorithm for VQ index compression is introduced and it utilizes the local statistics of each image and the repeating pattern of its adjacent indices. The proposed algorithm improves the index compression performance of the basic VQ, with a relatively slight increase of complexity.

## Keywords:

VQ Index Compression, Lossless Coding, Image Compression, Vector Quantization.

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Proc. 4th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT 2004), Rome, Italy , , pp. 287-290



( 2 )

# A New Image Compression Technique Based on Combining Feedforward Neural Networks and Discrete Cosine Transform

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## Abstract:

In this paper, we propose an algorithm for the application of one-hidden layer Feedforward Neural Network (OHL-FNN) to image compression. The algorithm combines OHL-FNN with Discrete Cosine Transform (DCT), here, the neural network learning algorithm performs the compression in a spectrum domain of DCT coefficients, i.e., the OHL-FNN approximates only the DCT coefficients representing the high detailed part of the image, Network parameters are stored in order to recover the image. Results, compared with baseline JPEG algorithm, demonstrate that the new algorithm dramatically increase compression for a given quality; conversely it increases image quality for a given compression ratio.

## Keywords:

Image compression, discrete cosine transform, Feedforward Neural Network (FNN)

## Published In:

Proc. 4th International Symposium on Communication Systems, Networks & Digital Signal Processing (CSNDSP 2004), Newcastle, U.K. , , pp. 448-451



( 3 )

## Utilizing Index Usage Map for VQ Index Compression

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### Abstract:

In practical vector quantization (VQ) of images, the used pixel block dimensions are kept small to reduce the cost of computations. This in turn results in highly correlated blocks and the corresponding VQ indices will inherit this high correlation. The compression of the basic VQ can be increased through utilising this high correlation of indices by inserting a lossless index compression stage after the VQ stage. A new index compression algorithm is introduced. In this algorithm the 2 dimensional index map is divided into nonoverlapping square blocks. Index usage in each of these blocks is employed to remap (renumber) the reduced number of actually used indices in this block, thus resulting in reduced bit rate expressed in bits/pixel. The proposed algorithm reduces the average bit rate by a value depending on the codebook size, namely a reduction of about 32% for codebook size of 64, and down to about 23% for codebook size of 1024. Moreover this algorithm lends itself to being cascaded by other index compression algorithms resulting in increased compression.

### Keywords:

VQ Index Compression, Lossless Coding, Image Compression, Vector Quantization.

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( 4 )

## □A Fast B\_SPLINE Based Algorithm for image zooming and compression□

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### Abstract:

NULL

### Keywords:

NULL

### Published In:

24th National Radio Science Conference, pp. C-20(1-9), Ain Shams, Egypt, March 2007 , NULL , NULL