Abstract

In the last few decades, Digital image compression has received significant attention of researchers. Recently, based on wavelets there has been many compression algorithms. In comparison to other compression techniques, image compression using wavelet based algorithms lead to high compression ratios. In this paper, we have proposed a image compression algorithm which combines the feature of both wavelet transform and Radial Basis Function Neural Network along with vector quantization. First the images are decomposed into a set of subbands having different resolution with respect to different frequency bands using wavelet filters. Based on their statistical properties, different coding and quantization techniques are employed. The Differential Pulse Code Modulation (DPCM) is used to compress the low frequency band coefficients and Radial Basis Function Neural Network (RBFNN) is used to compress the high frequency band coefficients. The hidden layer coefficients of RBFNN subsequently are vector quantized so that without much degradation of the reconstructed image, the compression ratio can be increased. In terms of peak signal to noise ratio (PSNR) and computation time (CT), a large compression ratio has been achieved with satisfactory reconstructed images in relation to the existing methods by using the proposed technique.

Neuro-Wavelet based Efficient Image Compression using Vector Quantization

Index Terms

Computer Science  Image Processing

Keywords

Image Compression  Radial Basis Function Neural Network  Back-Propagation
Neural Network
Vector Quantization