

University of Baghdad

College Name	Education college for Women		
Department	Computer Science Dep.		
Full Name as written in Passport	Iman Mohammed Jaafer Alwan		
e-mail	Ainms_66@yahoo.com		
Career	<input checked="" type="radio"/> Assistant Lecturer	<input type="radio"/> Lecturer	<input type="radio"/> Assistant Professor
	<input checked="" type="radio"/> Master	<input type="radio"/> PhD	
Thesis Title	A Proposed Multicircularlet Mixed Transform and Its Application for Image Compression		
Year	2009		
Abstract	<p>Image compression comprises an essential processing task in almost all applications where transmission and storage of digital images are involved. The purpose of this thesis is to present a new transform for the purpose of compression named Multicircularlet transform. This transform is derived from the GHM multiwavelet transform by applying the 2-D circular convolution function (hence its name) to its multiscaling and multiwavelets functions. Since a given scalar signal consists of one stream but the Discrete Multicircularlet Transform (DMCT) algorithm requires the input data to have multiple streams, two methods of mapping the scalar data to the multiple streams which is called “Preprocessing” were used and verified in this thesis. As preprocessing is done by a prefilter, a postfilter just does the opposite. The most obvious way to get two input rows from a given signal is to repeat the signal using repeated row preprocessing. This procedure introduces oversampling of data by a factor of two. Oversampling representations have proven useful in feature extraction ; however, they require more calculation than critically sampled representations. Furthermore in data compression applications, one is seeking to remove redundancy not to increase it as in the case of repeated row preprocessing. In this thesis also, Approximation-based Preprocessing has been studied and verified as a critical sampled representation of the signal which minimizes the calculation used for computing DMCT in addition for their advantages in minimizing redundancy for data compression applications. In order to achieve better compression results through using successive transforms, this new transform is followed by wavelet transform in a manner that best coefficients decomposition has gotten. The purpose of the mixed transforms based compression system is to code images in such a way that redundancy and visually unimportant information in the original image are removed. The coded images can represent the original image faithfully, hence after image transformation, a quantization and encoding process called Set Partitioning In Hierarchical Trees (SPIHT) is applied. This simple but remarkably effective</p>		

data structure is a mechanism for pointing to the locations where significant coefficients are clustered in the mixed transforms domain then encoded them. The compression system is designed for both gray and color images, and it also showed a very good response for noisy images, the decompressed image of noisy original one is of good quality that make the proposed system robust for noisy images.

The achieving results were compared with GHM-Mixed transform based compression system. The performance of the proposed compression system is comparatively better than that of second one. The increase in the PSNR value is approximately 0.44db to 3.6 db at the compression ratio from 20:1 to 40:1. This gave a good indication for the success of this proposed system.