

The initial pre-coding step is the most critical and important operation in the entire image compression scheme. The complexity involved with DCT and Wavelet based transformations is very high because of the huge number of multiplications involved in the operations. This is illustrated in the following equation.

$$DCT(i, j) = \frac{1}{\sqrt{2N}} C(i)C(j) \sum_{x=0}^{N-1} \sum_{y=0}^{N-1} f(x, y) \cos \left[\frac{(2x+1)i\pi}{2N} \right] \cos \left[\frac{(2y+1)j\pi}{2N} \right]$$

$$\text{where } C(x) = \frac{1}{\sqrt{2}} \text{ if } x = 0, \text{ else } 1 \text{ if } x > 0.$$

In addition to the huge number of multiplications involved in carrying out the above DCT equation, there also happens to be a zigzag rearrangement of the image data, which involves additional complexity. This clearly proves that the above mentioned conventional schemes for image compression are not very well suited for hardware based implementation.

So, the real requirement is a image compression system which does not involve any rigorous transforms and complex calculations. It also has to be memory efficient and power efficient. The present invention called as Repetition Coded Compression (RCC) is ideally suited for the above mentioned requirements. It is based on a single mathematical operation and requires zero multiplications for its implementations. This results in great amount of memory efficiency, power efficiency and speed in performing the