Abstract

Digital image requires large amount of data to represent, so it needs huge storage capacity, long transmission time and wide-band channel. Therefore, there is the need to find compression systems that is able to decrease the size of the data representing the image.

There are applications which require lossless data compression techniques. Such techniques find application in storage or transmitting of medical images and business document.
The performance of the known techniques for lossless compression depends on the statistical distribution of the image data. Therefore, there is the need to develop technique that is adapted according to image data variations. For this reason, an intelligent algorithm which uses the learning automata that depends on one of the linear-Reinforcement schemes type Reward-Reward with binary response and using Huffman code. This algorithm has been implemented using Mat lab 6.5.

Instead of using the single method which updates single probability a method called block method is suggested that updates block of probabilities and it is applied to three images with various block size and various gray level numbers.

A compression ratio of (2.00:1 – 2.75:1) is achieved for original images with (32) gray level without losing any information. The Entropy and average Huffman code of the original image have been computed and compared with obtained results.
The results show that block method depends on the block size, gray level number, and convergence time. It is proved that block method is superior to single method.

The research used a computer in the design and implementation of a computer-based teaching program in Visual Basic and depending on one of the instructional design models that follow the operational simulation (i.e. Dick and Carey Model), the present research has contributed in building a knowledge based on image compression techniques, an aid to simplify the difficulties facing the user in understanding the teaching program and fulfilling the connection between both sides, the theoretical and practical application.