Quality Assessment for Image Encryption Techniques using Fuzzy Logic System

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Abstract

There are many applications in image processing field; one of them is how to secure the image during transmission. In many cases there are different methods to encrypt the image. Each one of them has a different level of security that can be determined by using quality assessment techniques. The cipher image can be evaluated using various quality measuring criteria, these measures quantify certain features of the image. If there are many methods that can be applied to secure images; the question is what is the most powerful scheme that can be used among these methods? This research try to answer this question by taking three different encryption methods (RC5, Chaotic and Permutation) and measure their quality using the (PSNR, Correlation, Entropy, NPCR and UACI), the results of these criteria were input to a fuzzy logic system that was used to find the best one among them. The fuzzy logic output determine the degree of effectiveness for each method, many experiments have been executed on various images to show the ability of work to assess quality of the encryption method.

References


Index Terms

Computer Science                         Fuzzy Systems

Keywords

Correlation, encryption, entropy, fuzzy logic, NPCR, PSNR, quality assessment, UACI.