

A new approach in cryptographic systems using fractal image coding

ABSTRACT

Problem statement: With the rapid development in the communications and information transmissions there is a growing demand for new approaches that increase the security of cryptographic systems. Approach: Therefore some emerging theories, such as fractals, can be adopted to provide a contribution toward this goal. In this study we proposed a new cryptographic system utilizing fractal theories; this approach exploited the main feature of fractals generated by IFS techniques. Results: Double enciphering and double deciphering methods performed to enhance the security of the system. The encrypted data represented the attractor generated by the IFS transformation, collage theorem was used to find the IFSM for decrypting data. Conclusion/Recommendations: The proposed method gave the possibility to hide maximum amount of data in an image that represent the attractor of the IFS without degrading its quality and to make the hidden data robust enough to withstand known cryptographic attacks and image processing techniques which did not change the appearance of image.

Keyword: Iterated function system; Attractor; Affine transformation; Collage theorem; Iterated function system mapping