Novel Image Encryption of Color Image based on Henon Chaotic Systems and its Analysis

Abstract

In this paper a novel image encryption scheme is presented based on Henon Chaotic System for color images in order to perform secure transmission of image. The proposed cipher provides good transposition and substitution properties by performing EX-OR operation and circular right bit shift operation. The security of image encryption is enhanced effectively. The proposed method has also found its applications in the field of military environment. In first step, Arnold Cat Map is used for initial permutation. It performs shuffling of pixel positions. In second step, shuffled image is encrypted pixel by pixel based on Henon Chaotic System. The encryption includes first and third chaotic key for EX-OR operation and second chaotic key for right bit circular shift. The security of proposed encryption scheme has been analyzed using statistical analysis, Local Entropy analysis and key sensitivity analysis. The result shows that
this scheme is more secure and more efficient.

References

- Chen Wei-bin, Zhang Xin, Image Encryption Algorithm Based Henon Chaotic System, 2009, IEEE.
- Chen Wei-bin, Zhang Xin, Image Encryption Algorithm Based Henon Chaotic System, 2009, IEEE.

Index Terms

Computer Science  Security

Keywords

Image Encryption  Arnold Cat Map  Henon Chaotic Mapping  Entropy