In this paper, a proposed encryption scheme based on Henon chaotic system (PESH) is presented in order to meet the requirements of secure image transfer. Scheme based on Henon chaotic system by Chen Wei-bin et al., will be designated here as (SHCH). SHCH and a proposed encryption scheme (PESH) are applied for encrypting by changing the values of the image pixels. Combination of shuffling the positions and changing the values of image pixels is introduced to shuffle the relationship between the cipher-image and the plain-image. First, the Arnold Cat map or Baker chaotic map is used to shuffle the positions of the image pixels. Second, the shuffled-image is encrypted by using SHCH or a proposed (PESH) pixel by pixel. All of these procedures for encrypting are used with four modes of operations ECB, CBC, CFB, and OFB. The results of several experimental, statistical analysis, key sensitivity tests, NPCR
and UACI analysis, and time analysis show that, a proposed image encryption scheme (PESH) alone or combined with whatever of confusion algorithms Arnold Cat map or Baker chaotic map, is the best scheme and provides an efficient and secure way for image encryption.

References

- Chen Wei-bin, Zhang Xin. 2009. Image Encryption Algorithm Based on Henon Chaotic System. 978-1-4244-3986-7/09/$25. 00 © IEEE.

Index Terms

Computer Science

Security
Keywords
Arnold Cat map  Baker chaotic map  Henon chaotic system  Image encryption and Modes of operations