ISSN: 0974-2115
www.jchps.com Journal of Chemical and Pharmaceutical Sciences

Biometric facial image encryption for secure image storage

D.Vijendra Babu*, M.Thilak, A.Karthikeyan, V.Rajendran, P.Suriyaprakash
ECE Department,Aarupadai Veedu Institute of Technology, Vinayaka Missions Uiversity, Paiyanoor,Chennai, India
***Corresponding author: E-Mail:dvijendrababu@gmail.com**

ABSTRACT

Digital Image Encryption applied for Biometric Facial Image for secure Image storage. Initially, Binary Images are segmented with embedded secret keys. Segmented Binary Image is diffused into Red, Green & Blue components and bit planes are separated from the original Biometric facial Image through to XOR operations. Simulation has been performed in MATLAB using a standard digital biometric facial Image & live Images.

KEY WORDS: Encryption,Segmentation,Biometric,Security.

1. INTRODUCTION

Biometric Facial Image, which are unique and permanent identifiers that are widely used to be private and sensitive forms of personal information. Such Digital Biometric Facial Images have been used in a variety of applications such as in payment system, access controls and Forensics. Consequently, Security system for Digital Biometric Facial Images has been of much interest to improve the degree of security. Image Encryption scheme for such Digital Biometric Facial Images is highly required. Image Encryption may be classified into two types as (i) Pixel value substitution which focuses on the change in pixel values and (ii) Pixel location scrambling which focuses on the change in pixel position.

Conventional Cryptography such as Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), Advanced Encryption Standard (AES) and RSA algorithm may not be applicable in Real-Time Image Encryption due to large computational time and high computing power, especially for the images with large data capacity and high correlation among pixels. Recently, Image Encryption scheme using random sources have been alternatively proposed such as Scan-based method and Chaos-based methods.

2. MATERIALS AND METHODS

Cellular automata: Cellular Automata (CA) have also successfully been applied in the field of Image Encryption such as in with different permutation and diffusion methods. However, most encryption shames using CA are relatively complicated with large computational time found in that of existing image encryption schemes. In addition, an application of CA-based encryption for Digital Biometric Facial Images has not been realized .This paper presents the digital image encryption scheme for biometric facial image using Cellular Automata for secure image storage. Segmented CA binary image is diffused to the shuffled and bit-plane separated of the original biometric facial image through to XOR operations.

Flow chart: Fig.1 describes the Block diagram of the paper for Biometric Facial Image Encryption method.

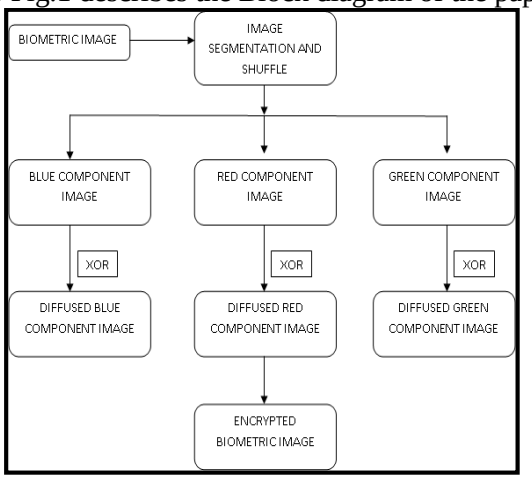

Figure.1. Block Diagram

Figure.2. Block Diagram

Digital Biometric Encryption: Fig.2 shows the Main menu of the Digital Biometric Encryption in MATLAB. The flow of the program follows as Image Acquisition, Extracting RGB Component, Input Encryption key, Diffusion for RGB, Encrypted Image & Decrypted Image.

3. RESULTS & CONCLUSION

Figure 3 & 4 shows the Image Acquisition, Image Shuffling respectively. Figure 5,6 & 7 shows the Encoded Red component, Encoded Green component & Encoded Blue component respectively. Figure 8 shows the Encrypted Image. Figure 9, 10 & 11 shows the Decoded Red component, Decoded Green component and Decoded Blue component respectively. Figure 12 shows the Decrypted image.

Figure.3. Image Acquistion

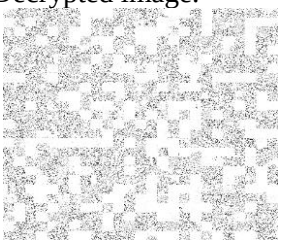

Figure.4. Image Shuffling

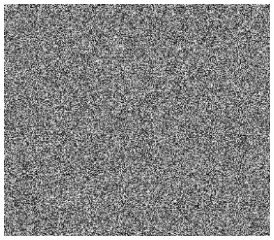

Figure.5. Encoded Red Component

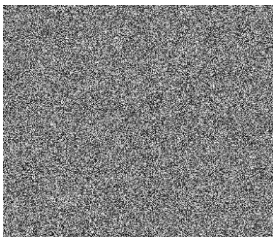

Figure.6. Encoded Green Component

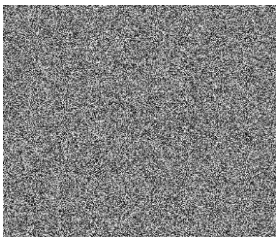

Figure.7.Encoded Blue Component

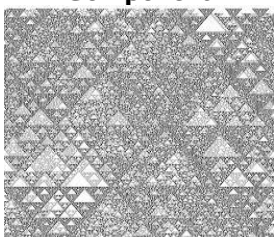

Figure.8. Encrypted Image

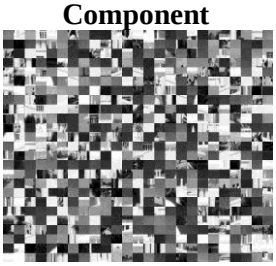

Figure.9.Decoded Red Component

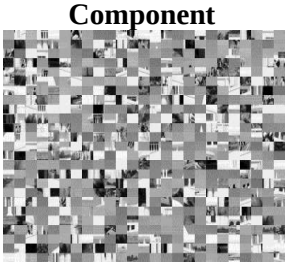

Figure.10. Decoded Green Component

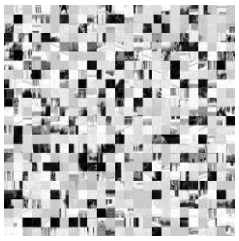

Figure.11. Decoded Blue Component

Figure.12. Decrypted Image

REFERENCES

Fateri S, Enayatifar R, A new method for image encryption via standard rules of CA and logistic map function, International Journal of Physical Sciences, 6, 2011, 2921-2926.

Karimian G.H, Rashidi B and farmani A, A High Speed and Low Power Image Encryption with 128- bit AES Algorithm, International Journal of Computer and Electrical Engineering, 4(3), 2012.

Ma X, Fu C, Lei W, Li S, A Novel Chaos-based Image Encryption Scheme with an Improved Permutation Process, International Journal of Advancements in Computing Technology, 3(5), 2011.

Raouf Khan A, On Two Dimensional Cellular Automata and its VLSI Applications, International Journal of Electrical & Computer Sciences, 10(6), 2010, 124-129.

Taewan Kim, Hyungsoo Park, Sang Hoon Hong, and Yunmo Chung, Integrated System of Face Recognition and Sound Localization for a Smart Door Phone, IEEE Transactions on Consumer Electronics, 59(3), 2013.

Vijendra Babu D, Alamelu N.R, Subramanian P, Ravikannan N, EBCOT using Energy Efficient Wavelet Transform, Proceedings of International Conference on Computing, Communication & Networking, 08 (ICCCN-08), 2008,IEEE Explore. 10.1109/ ICCCNET. 2008. 4787746

Vijendra Babu D, Shalini, Sharath, Niharika, Ismail, Linear Barcode Scanning system based on Dynamic Template Matching for OOF Blurred Images, Journal of Chemical & Pharmaceutical Sciences, Spécial, ISSN No.: 0974-2115, 9, 2015, 481-421

Vijendra Babu D, Subramanian P, Karthikeyan C, Performance analysis of Block matching algorithms for Highly scalable Video Compression, Proceedings of IEEE International Symposium on Ad Hoc & Ubiquitous Computing, Communication & Networking, 2006, 179-182.

Vijendra Babu D,.Alamelu N.R, Subramanian P, Ravikannan N, EBCOT using Energy Efficient Wavelet Transform, Proceedings of International Conference on Computing, Communication & Networking, 08 (ICCCN-08), 2008,IEEE Explore. 10.1109/ ICCCNET. 2008. 4787746

Von Neumann J, The theory of self reproducing Automata, University of Illinois Press, Urbana, 1966.