Cryptographic Text Watermarking in Medical Image with Reversible Property

P Viswanathan\textsuperscript{a} and P VenkataKrishna\textsuperscript{b}

\textsuperscript{a}School of Information technology and Engineering, VIT University, Vellore 632 014 India, Contact: pviswanathan@vit.ac.in

\textsuperscript{b}School of Computer Science and Engineering, VIT University, Vellore 632 014 India, Contact: pvenkatakrishna@vit.ac.in

The medical information of patients are uploaded in internet requires more amount of time. The information may be easily pirated and grabbed by the hackers due online. One of the solutions to solve this problem is using watermarking and cryptography in a single system, which is proposed in this article. In this technique, first, the document of the patient is encrypted. The cipher is embedded in the medical image using bit wise operation with reversible property. Due to embedding, some of the details of the medical image may be corrupted, which can be recovered by using reversible property. The proposed algorithm provides high payload capacity, less computational complexity, security, validation, quality and privacy of the patient.

**Keywords**: Encryption, Decryption, Embedding, Variation.

1. INTRODUCTION

The watermarking [1] is done in two domain namely spatial domain and frequency domain [2]. The spatial domain is based on methods [3] like Etrellis method and Basic message coding [4] in which the detector correlates the received image against each of the eight reference patterns. The Spread spectrum [5] watermarking method is based on frequency domain such as Discrete Fourier Transform and Discrete cosine transform based watermarking [6] embed the watermark in low frequency, high frequency or Middle frequency components.

The differential expansion embedding algorithm with reversible property is closely related to our proposed work, but the major drawbacks in this technique is that the quality of the image will be radically corrupted due to under stream, over stream and round up error problem and also have less hiding capacity [7]. The robustness depends on the dimension of bit plane. In order to secure the data, some work has been done using cryptographic system based on symmetric key system and asymmetric key system such as data encryption system, advance encryption system, RC2 and RC4 etc. [8].

2. CRYPTOGRAPHIC TEXT WATERMARKING IN MEDICAL IMAGE WITH REVERSIBLE PROPERTY

The medical image verification is the crucial course of action where the information of the patient must be maintained securely and certified without any distortion online. For this we developed an encrypted data embedding process known as fusion of cryptographic watermarking system shown in Figure 1. This system provides high secure, high payload capacity and confidentiality to the patient data. Once authenticated the original image is retained by this model. The drawbacks of the system are, it only supports the image of range 0 to 255 and if additive or removal of information in the medical image, affects the watermarking.

In this paper, The fusion of cryptographic and
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5. CONCLUSIONS

The fusion of cryptographic watermarking system ensures security to the patient information in keeping the information confidentially by encrypting and hiding the data within the medical image. This system reduces the need of multiple documents needed to maintain the information provides less storage compatibility. The cost is minimal, since all the operations are performed using bitwise operations and the reversible operation recovered the medical images from distortion due to data hiding.

REFERENCES


P Viswanathan is currently working as a Assistant professor in VIT University and registered PhD in VIT university. He received his M.Tech degree in Computer Science Engineering from the Annamalai University, India, in 2006. In 2002 he got B.E degree in Computer science engineering from Madu-
raikamaraj University. Until 2004, he worked as a lecturer in Tirumalai Engineering college, India. In 1998, he got the diploma degree in computer technology in sreenivasa polytechnic, State board of technical education, India. His main interests are digital image processing, watermarking biometrics and Computer graphics that is in shape analysis, description and segmentation.

P VenkataKrishna is currently working as a Professor in VIT university. He received his M. Tech Degree Electronics and Communication Engineering in Computer Science and Engineering from REC, Calicut presently known as NIT, and Doctoral Degree Computer Science and Engineering from VIT University, Vellore, 2008. He received his B. Tech degree in Electronics and Communication Engineering from SV University, Tirupathi, in May 1998. Since 1998 he has been working in the field of wireless sensor networks, image processing and pattern recognition. His main research activities concern with networking and image processing. He is Editor for International Journal of Systemic, Cybernetics and Informatics and for Journal of Advanced Computing.