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The Combination of Steganography and Cryptography for Medical Image Applications

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Article Info	ABSTRACT
	To give more security for the biomedical images for the patient betterment as well privacy for the patient highly confidently patient image report can be placed in database. If unknown persons like hospital staffs, relatives and third parties like intruder trying to see the report it has in the form of hidden state in another image. The patient detail like MRI image has been converted into any form of steganography. Then, encrypt those image by using proposed cryptography algorithm and place in the database.

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1.   INTRODUCTION

The security is the very big issue in present technology to overcome those issue in various field day by day so many new proposed technique is released every day but in the field of medical the security is very much important to give privacy and security for the patient details to avoid data hacking and data surfing in the hospital database even though hospital staff should not directly see the without permission of patient as well as doctor. The Proposed system deals with the MRI scan image for the patient and it should be pre-processed and then convert into steganography technique it is in the form of two things first one is in image form another type is in form of text form each time MRI image has been converted into text or image form [1-2].

The next step for the proposed system is from that using the proposed cryptography algorithm just convert those unknown form into another form for the purpose of security aspect to give privacy and authentication for the patient as well as hospital for high quality of service. MIAS database is used for the proposed system from that database the entire process has been carried out for the better result for the present technology result. The proposed system is not deals with the diagnosis of the disease from the image but the system is mainly focus on the security aspect of the system[3][4]. Basic diagram for proposed system as shown in Figure 1.
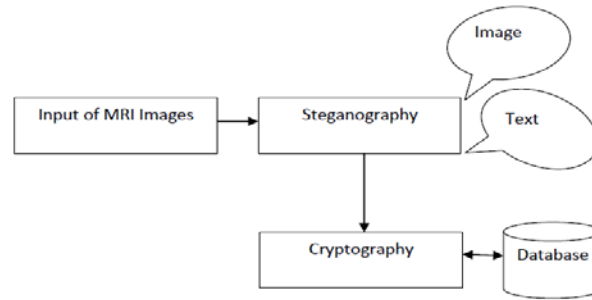
Figure 1. Basic diagram for proposed system

The proposed system is having two modules namely steganography form and cryptography module from the input image random chosen of image or text from the proposed system and then by using image conversion means MRI image has been converted into binary form and then plain image from the proposed algorithm identify the unused space from the plain image insert the MRI image into the plain image and now the MRI image is in unknown form and then encrypt the image into cipher text and store in the database. Likewise, if MRI image can also be convert into text and encrypt into cipher text and finally store into database [5].

2. METHODOLOGIES AND RESULTS
2.1. Initial Process for Image
The First and foremost process in the proposed system after getting the MRI image the system will random conversion of image or text from of the MRI image[6]. Random conversion for steganography process as shown Figure 2.
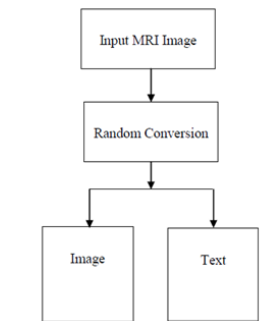

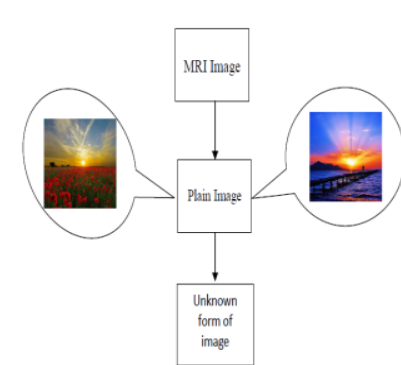Figure 2. Random conversion for steganography process

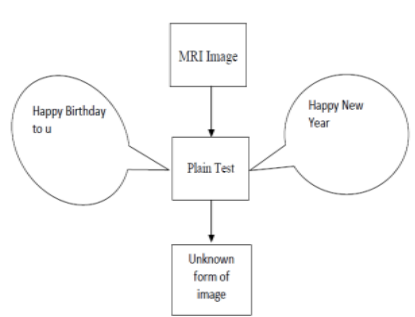Figure 3 Basic diagram of image for Steganography process

Figure 4. Basic diagram of text for steganography process

The Figure 3 and Figure 4 for the process of steganography has been shown in the Figures and finally store in the database of the proposed system[7]

3.   RESULTS AND DISCUSSION

The Proposed system have implementation of the entire process and which has process and execution time accuracy has been discussed in the system. The result of proposed system are available in Table 1

Table 1. Implementation Result of Proposed System

Image Type	Time (in sec)	Accuracy (in %)
JPEG	0.001	99.3
MPEG	0.001	99.4
BMP	0.002	99.5
PNG	0.001	99.5
GIF	0.001	99.4
PNM	0.001	99.5
BAT	0.003	99.3
BPG	0.001	99.4

From the implementation part the discussion has been made that the input image converted and result as well as graphs are available in the Figure 5 and Figure 6 for the proposed system.
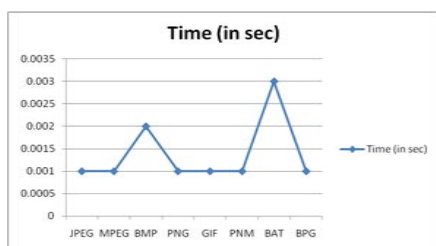

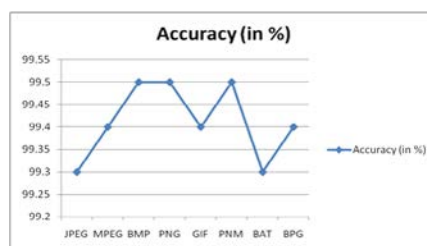Figure 5. Graph for image type & time taken for conversion

Figure 6. Graph for image type & accuracy from the conversion

4.   CONCLUSION

The experimental results reported in this paper shown in the Figure 5 and Figure 6 for the processing and efficiency of the entire proposed system is possible the justification shown in the implementation part is available. The proposed system deals with security of the present technology and which gives the input for the issues in the present system and solution to the issues of the present technology for the biomedical application for the medical sector for privacy and highly confidentially data of the patient.

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