

An Efficient ROI Image Watermarking on Geometric Attacks

Dr. Sheshang D. Degadwala^{*1}, Sanjay Chaudhary², Sanjay Gaur³, Dhairya Vyas⁴

^{*1}Head of Department, Computer Department, Sigma Institute of Engineering, Vadodara, Gujarat, India

²Associate Professor, Computer Department, Madhav University, Abu Road, Rajasthan, India

³ Associate Professor, Computer Department, JECRC, Jaipur, Rajasthan, India

⁴ Assistant Professor, E&C Department, Sigma Institute of Engineering, Vadodara, Gujarat, India

ABSTRACT

Watermarking is raised to apparatus for the Privacy of Intellectual Property Rights (IPR) of combination dates. In this paper, in the starting we have to fill the user name field and password field which will be secure afterwards that it will be make QR-code using zxing library and it is transformed into binary patterns for share-1 that is called Visual cryptography algorithm. Now share-2 is store into server database and it will be furthered use in future situation at receiver way. Now share-1 is hiding into the LL-Band with the help of DWT-SVD into block manner with Pseudo Zernike moment. Then it is sent to the network or internet. As in network there are many unlike attackers whose apply any Rotation, Scaling or Translation attacks on the hiding image. Attack image is expected at the end side or receiver side. To get prevent against attacks here at the starting stage use Pseudo Zernike moment then after Surf based feature extraction and it will recover the attacks pixel and scaling parameters value and using affine transformation recover the rotational parameters value. So then scale value and angle value is apply on attack image recovered watermark image. Now using DWT+SVD block method extract the water mark share-1. So on system with share-1 and another share-2 will be in server side so now by using EX-OR process for getting QR-Code. At the last stage QR-code is translated and fill field user name and password vale to login the system successfully.

Keywords: Quick Response, Visual Cryptography, R-Band, LL-Band, Rotational Scale and translation attacks.

I. INTRODUCTION

In today's world we need to transfer confidential document, images from one place to another, so we need security to protect the data from the hackers hence visual cryptography is one of the most prominent approach to securely transmit data effectively and efficiently. But it is not robust against various types of intentionally/unintentionally attacks from the hackers in transaction processing (Singh, Agarwal and Gupta, 2014). Hence, digital watermarking is best solution for providing more

security to client/server shares in open communication channel during the transaction process. Now, in some existing methods only provide security against some normal attacks like Gaussian attack, jpeg attack, salt and pepper attack, etc. (Song, Sudirman, Merabti and Jones, 2010). But it is not robust against RST invariant attacks. So that we propose new approach for secure transaction of the data with two-way authentication scheme, hence we use 2-out-of-2 visual cryptography scheme with DWT (Discrete wavelet transform) based geometrically invariant image watermarking technique (Shi, Wang,

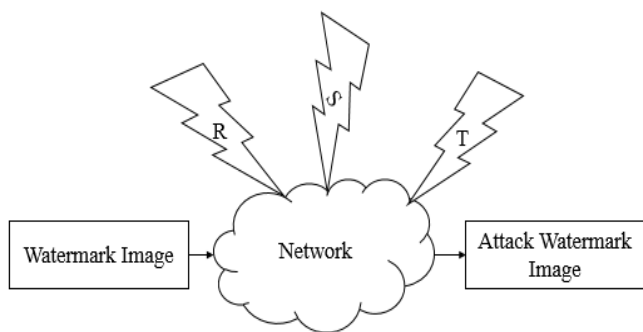


Figure 1: RST attacks on Network

To start new rapid contextual for watermarking, introduce the past in the documents hiding with associated terms. So on, further proceed onward will into discourse on the image watermarking system, prerequisites that watermarking framework must meet, sorts of the watermarking, Different attacks on a watermarking framework show in Figure 1.

II. PROBLEM STATEMENT

There are many methods for watermarking type's spatial domain and frequency domain, and it is used to protect information. Some of them are uses very complex methods which are very time consuming and some source information losses. If someone is transmitting his private information by using watermarking technique, there are too much chances that the person lost private information because of any kind of external attack by some hacker or communication channel noise.

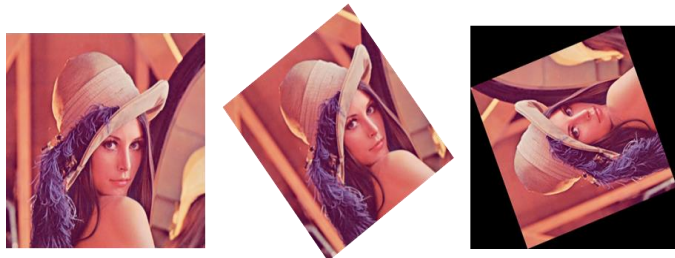


Figure 2: Dual RST attacks

So here our main problem is to secure data in less time without affecting source information by making simple image processing algorithm.

III. RESEARCH METHODOLOGY

Research methodology is the pursuit for information finished purposes and orderly process of outcome resolution to a tricky is investigation. The persistence of exploration is to notice reaction to enquiries over and done with the request of technical measures. The key goal in this research to discovery out for truth that is hidden and which has not been discovered as yet. Research methodology helps us in analysing the logic behind the methods being used so that the research results can be evaluated properly. The reliability of the findings in a research study depends on the methodology adopted, therefore the methodology used in this study is being presented as follows:

A. QR-CODE

QR code has five main properties because of these they have six main characteristics: extraordinary ability encrypting of information, minor printout dimensions, Kanji and Kana ability, clay and harm battle, legible from any way in 3600, and organized adding feature, these six possessions are (Delphin Raj K. M and Nancy Victor, 2014):

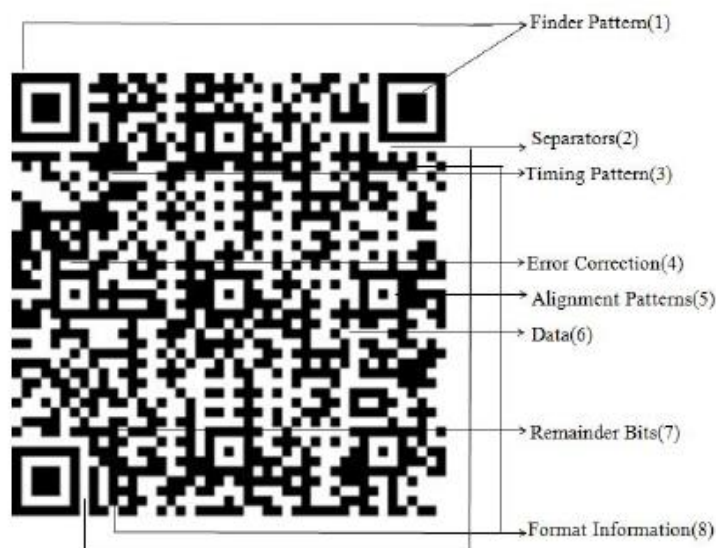


Figure 3: Assembly for QR-Code

B. VISUAL CRYPTOGRAPHY

VCS is a novel carrying of cryptographic impression that labors on deciding the difficulties of circulation the secluded pictures. VCS Hosting those limit with hide information/data, for example, distinct unpretentious components will be exceptionally lucky (Farzin Ahammed Sulaiman, 2015). Toward the perspective at the majority of the data may be concealed inside separated images, it is inside and out unrecognizable. During those side of the point at the stakes would partitioned, those data may be completely vague. Each picture holds notable odds of the data and when they are stacked together, the puzzle message camwood be recovered effortlessly. Each offer depends on upon one another (with a particular conclusion objective on get those decoded information (Jithi p, Anitha t Nair, 2013).

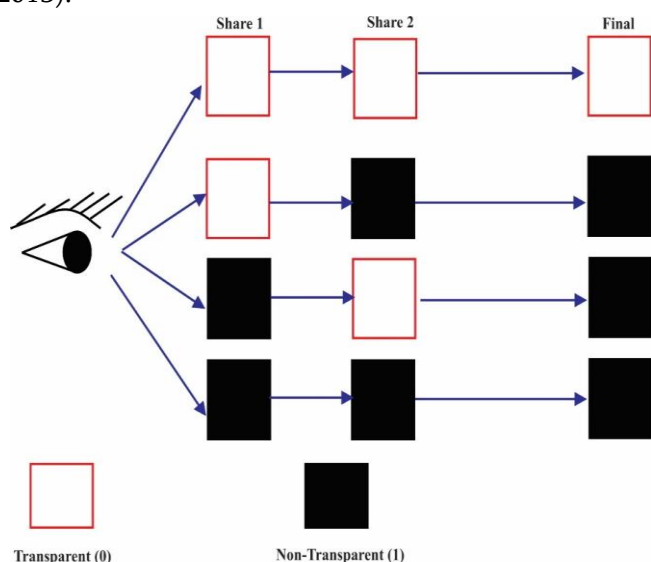


Figure 4: Human Visual Scheme

A pixel is a littlest component of an advanced image. In a 32-bit advanced image every pixel comprises of 32 bits, which is isolated into four sections, in particular red, green, blue and alpha; each with 8 bits. Alpha part introduces level of straightforwardness. In the event that each bits of Alpha part are '0', then the image is absolutely straightforward (Pallavi V. Chavan and Dr. Mohammad Atique, 2012). Human visual framework goes about as an OR work. In the event that two straightforward items are stacked together, then the last heap of articles will be straightforward. Be that as it may, in the event that one of them is non-straightforward, then the last pile of items will be

non-transparent. Like $0 \text{ OR } 0 = 0$, considering 0 as straightforward and, $0 \text{ OR } 1 = 1$, $1 \text{ OR } 0 = 1$, $1 \text{ OR } 1 = 1$, in view of 1 as non-straightforward as shown in figure 2.2 (Chavan, Atique and Malik, 2014).

C. WATERMARKING WITH VCS

Watermarking is the method of implanting a mystery image into a host image without influencing its quality. Some procedure is utilized to uncover the mystery image. The in distinguishability of the watermark (mystery image) from the cover image is the critical favorable position of watermarking. Difficult to recognize, opposes common bends, bears vindictive assaults, conveys various bits of data, equipped for existing together with different watermarks, and requests little calculation to embed and extricate watermarks are a portion of the fundamental attributes of watermark. To oppose un-malevolent or pernicious assaults like scaling, editing, lossy pressure etc., strong watermarking is utilized. There are distinctive sorts of watermarking systems. In light of the prerequisites for watermark extraction or discovery, watermark can be separated into Non-daze, Semi-Blind and Blind plans as shown in Figure 5.

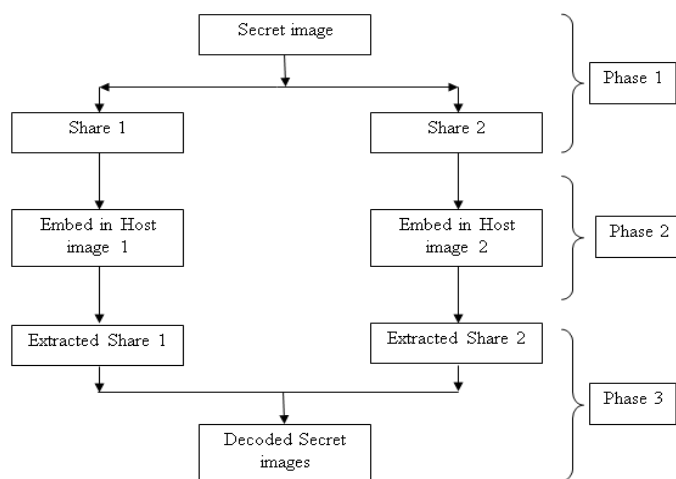


Figure 5: Structure of Watermarking with VCS

D. ATTACK RECOVERY TRANSFORM

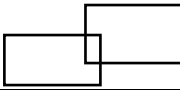
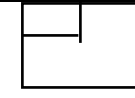
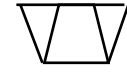
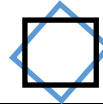
Image Enlistment calculations could additionally make ordered as stated by the change models they use on relate the target image space of the reference image space. To start with wide class about conversion models incorporates straight transformations, which

incorporate rotation, scaling, translation, what's more different relative transforms. Straight would worldwide clinched alongside nature, thus, they can't model neighbourhood geometric contrasts between images. Those second classification about transformations permits 'elastic' alternately 'no rigid' transformations. These transformations would fit from claiming mainly warping the focus image on adjust to those reference image.

1) SURF Transform: SURF is a scale-invariant affection finder based on the Hessian matrix as it is, example of the Hessian-Laplace finder. Though, somewhat than application an altered admeasurement for choosing the area and scaling, the account of the Canvas is acclimated aimed at together. The Hessian cast is almost approached, application a set of container blazon filters, and no cutting is activated back activity after one calibration to abutting (Bay, Ess, Tuytelaars & Van, 2007).

2) Affine transform: Illustrations of relative transformations incorporate translation, scaling, homothetic, similitude transformation, reflection, rotation, shear mapping, also compositions about them done whatever consolidation What's more grouping. If affine spaces X and Y are, again every affine $f: X \rightarrow Y$ is of the anatomy $x \rightarrow Mx+b$, area M is a beeline transform on X and b is an agent in Y. clashing an absolutely beeline transformation, an affine map charge not bottle the aught point in a beeline space. Thus, every beeline transformation is affine, but not every affine transformation is linear.

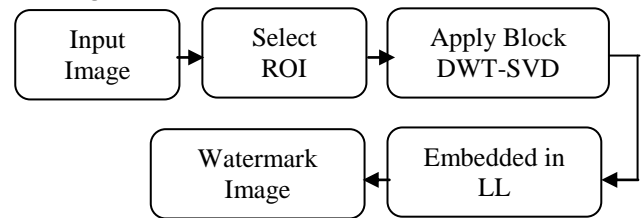
TABLE I
AFFINE TRANSFORM

Affine Transform	Example	Transformation Matrix
Translation		$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ t_x & t_y & 1 \end{bmatrix}$
Scale		$\begin{bmatrix} s_x & 0 & 0 \\ 0 & s_y & 0 \\ 0 & 0 & 1 \end{bmatrix}$
Shear		$\begin{bmatrix} 1 & Sh_x & 0 \\ Sh_y & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$
Rotation		$\begin{bmatrix} \cos(q) & \sin(q) & 0 \\ -\sin(q) & \cos(q) & 0 \\ 0 & 0 & 1 \end{bmatrix}$

3) Pseudo-Zernike Polynomials: PZM is a well-known and widely castoff in the analysis of visual systems. The individuals would likewise lengthily utilized within image examination similarly as shape descriptors. PZM will be geometric-based minute that employments those worldwide data over a image to extracting offers. The orthogonal minutes about PZM would shift, rotation, Also scale invariants which need assistance suitability to example distinguishment requisitions.

IV. PROPOSED SYSTEM BLOCKS

Embedding:-



Extraction:-

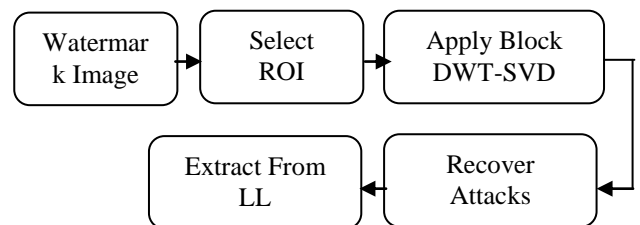


Figure 6: Proposed System

As shown in the Figure 6, two process are describe in the block one is for embedding and another is de-embedding.

A. Embedding: In this methodology as demonstrated in the figure 6 select ROI about 256x256 those shade disguise picture. Selection starting with those picture R, g Furthermore b segment. Presently select R-Channel Also relate P-Zernike minute Furthermore DWT-SVD change furthermore extricate LL-bit. In the LL-Bit embedding the Share-1 information. Following Invers DWT-SVD conversion to produce R-Embedded ROI picture that is included once more under R-image et cetera Notwithstanding include stay g What's more b channel will make Color installed medicinal picture. Shade installed picture will be transmitted under those web different Attackers apply Non-Symmetric rotational strike on it.

B. De-Embedding: Then afterward Non-Symmetric rotational strike getting those assault shade picture which will be presently apply the P-Zernike minute with surf characteristic extraction should recuperate strike. From assault recuperate picture select those ROI parcel from claiming 256x256 of the picture then extricate those R-Component. Presently Extracting the allotment 1 and it will consolidate with an alternate database allotment 2 will produce QR-image. QR decoder will unravel those Username What's more watchword. Those excellence about our framework lies in the truth that, though whatever assailant makes a duplicate from claiming any picture allotment will fashion it after those watermark will be bended along these lines to such fashioned picture offer our framework won't permit those era of host picture from the stack for 2 picture offers. Thus, the assailant won't get the unique picture. Here I utilization independent quality decay discrete wavelet change built watermarking system which may be non-symmetric revolution resistance plan.

V. RESULTS AND ANALYSIS



Figure 7: QR-code and Share Generation

As shown in Figure 7. User name and password will enter by the user then will be the QR-code generated by zxing library. Last is share 1 image generated by apply VCS algorithm.

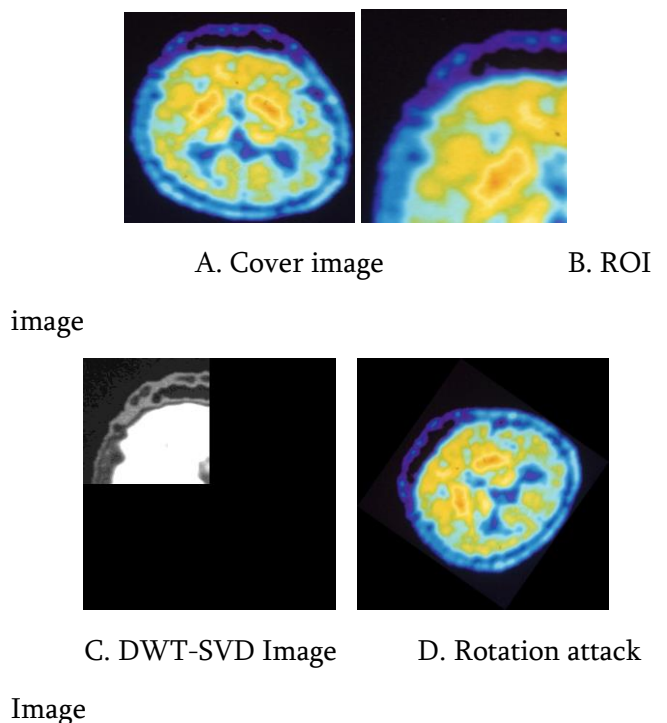


Figure 8: Data embedding and Dual RST attacks

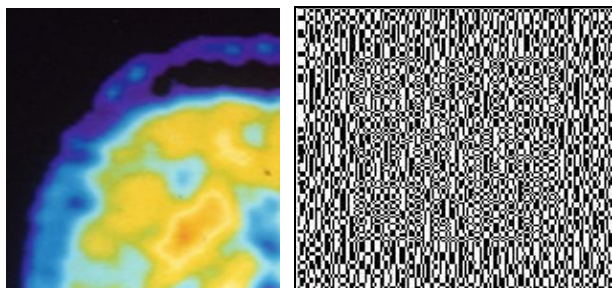
As shown in Figure 8 Color image after ROI selection the ROI image then DWT-SVD to getting then LL-bit

this image is now Combine with G and B to Create Color Watermark image. Attacker apply RST Attacks.

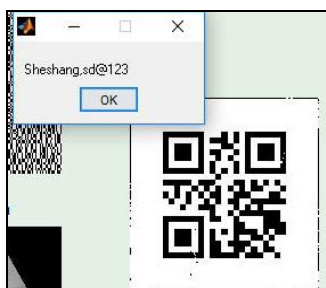


A. Recover data B. Recover

image



C. ROI Extracted D. Recovered Share-1



E. Recovered QR-code and ID & PSW

Figure 9: Recover of attacks and QR-code

Figure 9 shows the recover angle and Scale using P-pseudo Zernike and Surf Transformation. Then extracted ROI image Recover Share 1 from RST attacks for Recover the Username and password.

TABLE II
ANALYSIS OF PSNR & MSE

Rotation	PSNR	MSE
0	63.083	0.028
15	64.043	0.025
30	65.063	0.023
35	65.053	0.022
40	66.021	0.021

45	66.081	0.023
55	64.093	0.022
65	65.023	0.024
100	65.033	0.019
120	66.071	0.022
180	64.081	0.024

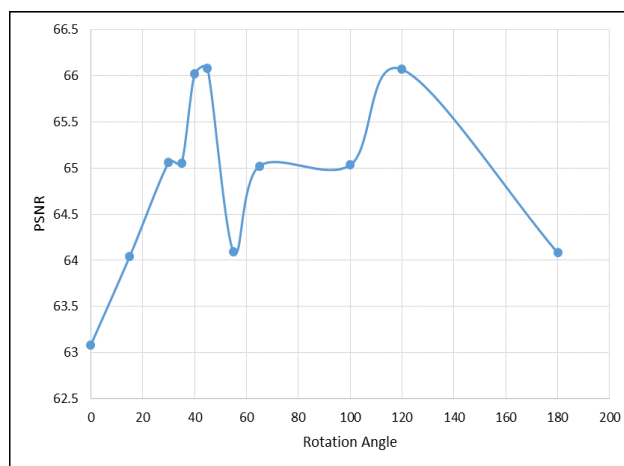


Figure 10: PSNR Plot

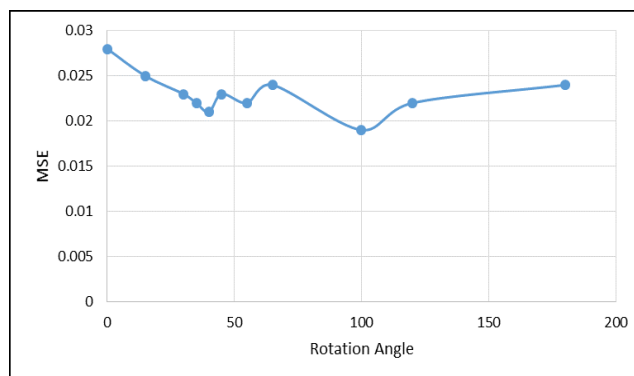


Figure 11: MSE Plot

TABLE III
ANALYSIS OF SHARE GENERATION

No. of Shares	Time (Second)
2	0.46
4	0.54
8	0.72
16	0.98
32	1.46

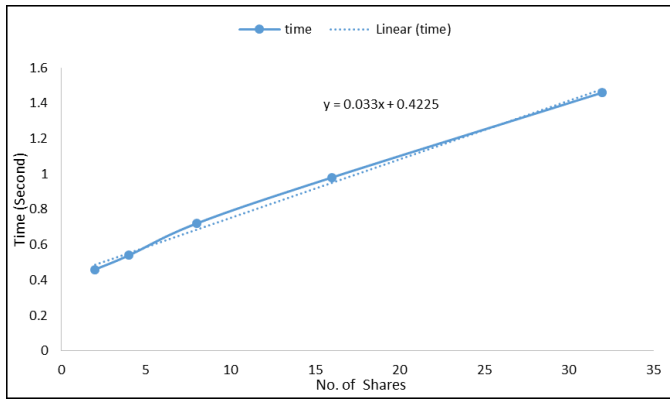


Figure 12: Share Generation time Complexity

TABLE III
ENCODING DECODING COMPLEXITY

Data Capacity	Encode Time (Second)	Decode Time (Second)
32x32	0.5	0.2
64x64	0.61	0.31
128x128	0.64	0.33
256x256	0.67	0.34
512x512	0.7	0.35

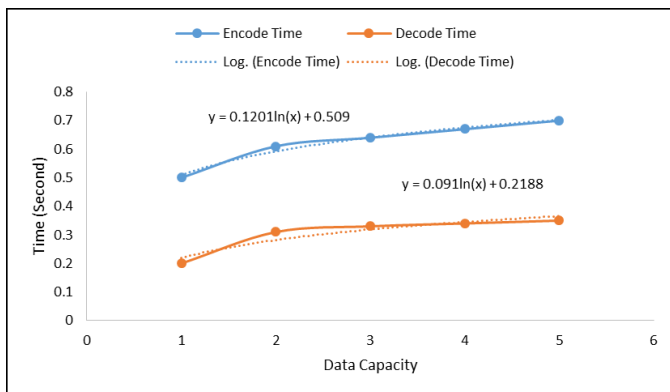


Figure 13: Encoding-Decoding time Complexity

VI. CONCLUSION

In this research proposed system converts charter into QR-code and protects against Dual RST attacks in my Proposed Privacy Preserving System for retrieval of RST Attacks by using Association approach of DWT-SVD in block manner with Pseudo Zernike Moment and features extraction of surf. So, on Affine

transformation is used to recover rotational value and recover watermarked image data. At last verification done using PSNR and MSE value and getting that proposed approach gives Effective as well as Confidentiality Preserving sending data for Modern Schemes. It concludes that the PSNR value increases above 60db and MSE value decreases below 0.20 for Color image images. The Time Complexity of Share generation is $O(N)$. The Time Complexity of Encoding-Decoding Process is $O(N\log(N))$. In Future work on cropping attacks as well as combination of noise attacks will give future direction of research.

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