

# A Secure Approach of Image Encryption using QR Code on Social Media

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*Abstract— Social data as the name suggest is the large collection of the data for which the traditional data processing techniques are not sufficient. Social data is now gaining popularity very fast in the internet era. Many social media sites like Face book are using the vast data storage mechanism. In this paper we will discuss about that data storage using big data and its security. Now-a-days, every second millions of profiles are accessed around the world where thousands of thousand photos are uploaded. To store these photos and many other data uploaded by user we use big data. But due to some security issues and loop holes, these photos can be hacked or downloaded easily and also millions of fake ids are created. These loop holes degrades the security of social media sites. So, to make the advancement in the security, in this paper we suggest the use of QR code concept. Further in this paper we will also discuss the approach which is used for the security of personal data over social media and also prevent from the fake ids.*

**Keywords—QR code; Big data; Fake ID'S; Security**

## I. INTRODUCTION

Social media or "social networking" has almost turned out to be aspect of our daily lives and being tossed close to more than the past few decades. They are presenting each and every aspect of our planet within the reach of your fingertips, which you can access sitting at the comfort of your home. It is like any other media such as newspaper, radio and television but it is far additional than just about sharing info and ideas. Social networking resources like Facebook etc. have facilitated creation and exchange of concepts so rapidly and broadly than the conventional media. Millions of numbers of users are now connected with this medium which in return promotes the more and more data exchange over internet. This data is stored somewhere by the social media which also enhanced the need of bulky storage facility, thus to support this bulk storage a term Big data was introduced. Big facts is high-volume, high-velocity and/or high-variety information properties that request good-price, tending to new forms of information processing that give power gave greater value to power of seeing into, decision making, and process automation. In this paper we only discuss about the image storage and its security over the internet while using social media like Face book. In traditional approach we used the asymmetric cryptography. This approach uses two keys for encryption of images, private key and public key for encryption and decryption respectively but this method

was not that much secure. Therefore, here we discuss the new approach in this paper for the image security using the QR codes in the social media. In the next section, we will see the current approaches which are used in social media. In Section III we discuss about the problem and describe our proposed approach in detail. In section IV we take a look on the results generated by our proposed approach. In last we discuss about the conclusion and future scope of our method.

## II. CONVENTIONAL METHODS USED FOR IMAGE ENCRYPTION

### A. Logistic Map

Logistic map is a variety of without order system that was made remarks early and used widely in many right times for its simple-expression and easy-realization. In this paper, nonlinear Logistic map formed in space (times) between is made clarification, which is mathematically expressed as [1]:

$$y_{k+1} = 1 - \alpha y_k^2 \quad (1)$$

for  $0 \leq \alpha \leq 2$  when values of  $\alpha$  varies from 1.40115 to 2, Logistic map becomes chaotic method, and the generated maps are chaotic maps. Set  $\alpha=2.00000$ , Logistics map is:

$$y_{k+1} = 1 - 2y_k^2 \quad (2)$$

### B. Traditional Chaotic Image Encryption Method

Image scrambling huge change is a common taking care way made use of in image encryption. however, as old and wise image scrambling has positive promptness and periodicity, it can effortlessly be busted by the attacker. Without order image encryption algorithms have more safety needing payment to good properties of without order. But on the other hand, old and wise without order image encryption methods generally use a without order produced by a single without order system for image bit of picture great change, and it is basically the imitation of the general idea of without order stretch out nobodies. Not like wording facts, the by numbers, electronic image is normally stored in the form of 2 to do with measures order lines, and the image bit of picture matrix is firstly converted into one-dimensional order, then a without order is used to scramble the position of image bit of picture or get mixed the value of image bit of picture by operation XOR.

These encryption methods only bliss image data as normal wording facts make bigger out, and do not give thought to the image data storage quality of [3,4].

C. *ARNOLD'S CAT MAP.*

ACM, the order is put on the scene without behavior that individual parts of the system constitutes one of the most studied examples. Vladimir Arnold in his work he used an image of a cat in 1960 Arnolds cat map (ACM) discovered. There are a few words relating to ACM, and the second step is to place a torus. Took a distant connection axis that is coplanar circle around a torus, three regular-size spaces in a moving circle round is over. A phase space of all states in the round space represented by this point are nothing like the one where all the possible states of a system, are represented, which is not a place. Now would be a spread and a torus in the phase space trajectories, different parts of the system that has formed folds, as ACM maps without certain order, one comes to [6].

D. *HENON MAP*

Henon map, one of the most studied example of the discrete time dynamical system that exhibit chaotic behavior. It takes a point  $(x_n, y_n)$  in the plane and maps it to a new point,  
 $x_{n+1} = y_n + 1 - a \times x_n \times x_n$   
 $y_{n+1} = b \times x_n$

The map depends on two parameters,  $a$  &  $b$ . For the classical Hénon map, the values of  $a$  &  $b$  is 1.4 & 0.3 respectively & so the map is chaotic. The map may be chaotic, irregular, or converge to a periodic orbit for other values of  $a$  &  $b$ . The map was introduced by Michel Hénon. For the classical map, an initial point of the plane will either approach a set of points known as the Hénon strange attractor. The Hénon attractor is a fractal, smooth in one direction and a Cantor set in another. Numerical estimates yield a correlation dimension of  $1.25 \pm 0.02$  and a Hausdorff dimension of  $1.261 \pm 0.003$  for the attractor of the canonical map[4].

III. RECENT METHOD USED FOR IMAGE ENCRYPTION ON SOCIAL MEDIA AND QR CODES

A..P3(Privacy-Preserving Photo Sharing)

The advent of mobile devices with high-resolution cameras on board, along with photo sharing has become highly popular. Users use either Flickr or Picasa, or Facebook or Google as popular social networking services like photo sharing services to share photos through. The photo sharing service providers have (PSP) PSP picture storage subsystems which is now the interesting system for research which has led to the point where it has a large user base [1].

However, this development has raised another important issue that is privacy . Now-a-days, private data including photos are leaked from prominent photo sharing sites which are assumed as secure sites [2]. Furthermore, widespread concerns have been raised about the application of face recognition technologies in Facebook [3]. Despite these privacy threats, the use of photo-sharing services will be reduced in the near future

that is not clear. Photo sharing services provides a spontaneous picture-browsing experience along with many useful functions. In addition to providing photo storage, photo browsing when on PSP also, incidentally affects bandwidth usage and also provides the image transformation (like cropping, resizing and color space conversions) on the server side which also results in improvement in the latency [5].

F. *QR Codes*

QR codes are capable of storing a vast amount of information a new type of two-dimensional barcode, and so much more than the standard bar code applications. This makes them free QR code scanner available through the App Store, aided by the fact that smart-phone users an excellent tool for marketing creates. QR codes are ease to use and do not require special equipment to scan. Just open the QR code, a barcode scanning applications, the phone's camera, aim and wait for the camera to read the barcode. [7]

They measure only sideways unlike traditional barcode, which means that one-dimensional. Barcode scanner laser shines on it from one side to the other until it is all the way across, the code or the very bottom to the top, no matter what the scans. That is not the case with QR code. QR codes are arranged like a grid, which means "matrix barcode," or "2-dimensional" (2D) is a type of barcode. 2D barcode modules are arranged in patterns to encode from side to side and up and down the measure, and measure the height of a factor, because the traditional black bars "module" or "data points." The black squares are replaced with letters to make words pattern are arranged in the barcode information and these different patterns are called "password or codeword". Currently, 2D barcodes have 49 different types. Most types of 2D codes are American companies related to proprietary technology, and more often used externally for marketing to the public than are used by manufacturers for internal operations. QR codes were originally developed by Denzo Wave, a subsidiary of Toyota got it patented, but for the public sector and the private and for commercial purposes, they were released free since then [8, 6].



Fig.1. Bar Code



Fig.2.QR Code

QR codes are used for the variety of purposes. It makes static ads "Clickable" even digital and physical world is able to connect to the market, but perhaps most important is the ability to launch URLs in the mobile web browser. This feature is a very basic concept, but for creative marketing, this direct marketing and point-of-purchase represents a giant leap forward. Anything that can be put on a web page that is now in the real world can be connected directly to physical signage. Advertising on the road can be connected directly to a purchase page, and contest announcements a sign-up page, you can link directly to participants. Another effective use of QR codes is the rearrangement of physical objects. QR codes placed on product labels, pages rearrangement re-arrangement facilitates growth and to improve the chances of repeat sales could be added [7].

#### IV. PROBLEM DEFINATION AND PROPOSED APPROACH

##### A. Problem Definition

After discussing the existing method of image encryption we conclude that existing method has some loop holes in context of image encryption like privacy, time in image encryption. Our research is mainly concentrate on how to minimize the timing process in image encryption and secure the image on social media. Because an image plays an important role in information sharing.

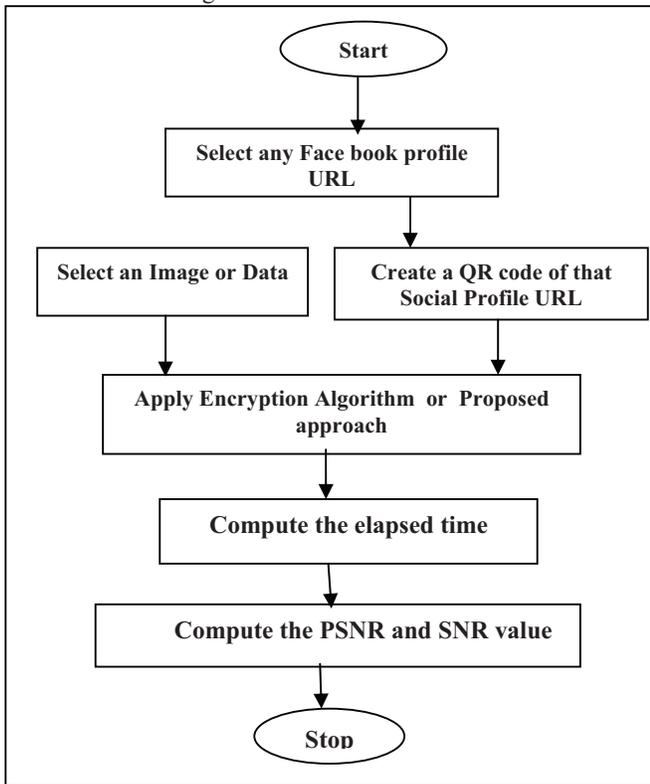


Fig.3. Block Structure of Proposed Approach.

Images are easily downloaded and shared by attackers and hackers in the present era. Lots of fake Id is created using any social profile data of any face book profile. Images are easily downloaded by any new user on profile

##### B. Proposed Approach:

In Fig-1 diagram we show how our proposed approach is worked. In next section we describe how our proposed approach is worked. Proposed approach coded in MATLAB 2010 environment using Arnold Cat method of image encryption.

##### I. Select any Face book Profile URL:

In this step we create a QR code of any social facebook profile. For example  
<https://www.facebook.com/amit.yadav.775>

##### II. Create a QR code of that social Profile:

It is a URL of Amit Yadav profile, now we create a QR code. QR code for every profile is unique and identical. Which helps to maintain data privacy.

##### III. Select any Image or Data:

In this step we select any image or data which we want to upload on face book profile.



Fig.4. Image which we want to upload.

##### IV. Encrypt QR code with uploaded images of that profile:

In this step we encrypt the QR code with uploading image using logistic map technique (Arnold Cat Map). In Mat-lab 2010

##### V. Calculate the Elapsed Time and PSNR

In this step after encrypted the image with QR code we calculate the Elapsed time, PSNR and SNR value in MATLAB 2010

#### V. RESULT ANALYSIS

In this section we take a look on results of proposed approach which is programmed in Mat lab 2010 environment using Arnold cat map image encryption method. We calculate the Elapsed time and PSNR value of encrypted image and analysis that how the uploaded images are more secure than normal uploaded image. We take a different size of images and calculate its elapsed time and PSNR value. In table-1 we show the elapsed time of image encryption on different size of images. In table-2 we show the PSNR and SNR values of these images-

TABLE I: ELAPSED TIME

IMAGE(SIZE)	ELAPSED TIME
IMG-1(600*333)	0.050931 Sec
IMG-2(1024*568)	0.0150229 Sec
IMG-3(800*444)	0.090595 Sec
IMG-4(640*355)	0.057902 Sec
IMG-5(448*249)	0.028494 Sec

TABLE II: PSNR AND SNR VALUES OF IMAGES

IMAGE(SIZE)	PSNR	SNR
IMG-1(600*333)	64.9745	52.3330
IMG-2(1024*568)	65.1017	52.3361
IMG-3(800*444)	65.1034	52.3351
IMG-4(640*355)	65.0971	52.3338
IMG-5(448*249)	65.1392	52.3359

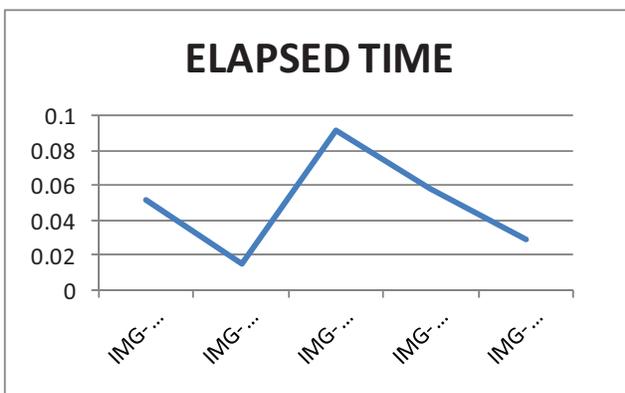


Fig.5. Elapsed time of different size of images

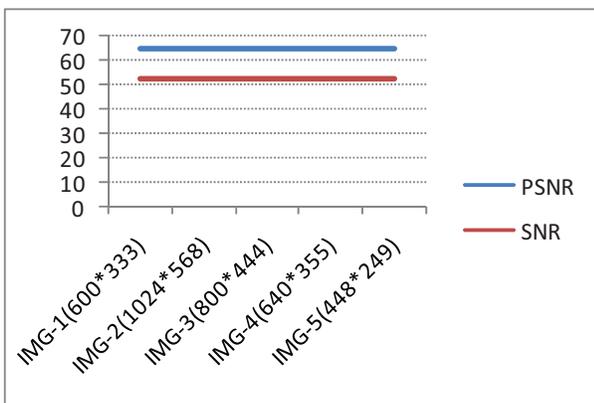


Fig.6. PSNR and SNR values of different size of images

## VI. CONCLUSION & FUTURE SCOPE

### A. Conclusion

In this paper we discuss about image encryption and how image encryption is related and affect the social media.

Encryption of data is the main security concern in today's technology era. So we conclude that existing method is also good but proposed approach gives best results in term of security and privacy. Because QR codes are the new facing technology of data hiding and privacy. Proposed approach gives best results in less time and gives the highest ratio of PSNR and SNR.

### B. Future Scope

In future our proposed approach gives best results in image encryption I wish in future all social media encrypt the data using QR code scheme. Its gives more security and privacy of user data. If user want to share its QR code then the images are downloaded by any user

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