Embedding Color Image with QR Code Including Securing and Noise Removal of it

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***Abstract*-The invention and growth of smart phones and mobile devices has created wide verities of opportunities in the publicity strategies for companies. Mainly widespread forms of engaging mobile users from printed materials is based on the use of QR codes, which finds its applications in many sectors such as downloading content or accessing websites. QR Codes are found to be very reliable and convenient way to introduce textual information into mobile devices without many complications. The main theme of the project is based on developing algorithms for embedding QR codes into logos or images which make such images appear with more visual clarity appealing to the user while decoding with greater robustness. This method is in contrast to previous approaches and here this allows to automatically embedding QR codes into images.**

Keywords*— *QR code; embedding; smart phones

I. INTRODUCTION

QR code (abbreviated from Quick Response Code) is a is a machine-readable code that contains information about the item to which it is attached. A QR code uses standard encoding modes (numeric, alphanumeric, byte) to efficiently store data. A QR code consists of black modules (square dots) arranged in a square grid on a white background, which can be read by an device like smartphones. The required data are then extracted from patterns present in both horizontal and vertical components of the image.

II. OBJECTIVE AND SCOPE OF THE PROJECT

The project introduces the concept of embedding QR codes into color images. The embedding is well- matched with standard decoding applications and can be useful to any color image. The QR information bits are encoded into the luminance values of the image.To alleviate the visual distortion of the QR image, the algorithm makes use of Halftoning or binarization method for the selection of pixels and color optimization for obtaining embedded color image.

A. Applications

To bookmark a webpage
To initiate phone calls
Send short messages
Send emails
Produce links to web URL's
Access information
Wrist band for medication history
Marketing industry
Advertising sector

III. PROBLEM DEFINITION

In existing system, image is placed in the middle of the QR code. Only middle part covers with image, apart from the image some empty space are left in QR code. Problem of the existing system is unused space in QR code. Because of this while decoding the image at receiver side visual distortion will come. Even if the image is of high quality, while decoding the QR image it is not giving the optimal result.

IV. EXISTING SYSTEM

The main challenge of any embedding method is the fact that they should be decodable by standard applications. The disadvantage hear is embedding of image pixels introduces changes in the luminance of the code, distorting the binarization thresholds and thus increasing the probability of error. The second challenge concerns the problem of using the entire area of the QR code into the image or logo

to be embedded. This cannot be achieved by simply replacing information modules with the desired image since the number of modules that can be replaced is at most proportional to the correction capacity of the code. A good embedding method should minimize the number of corrupted modules and use the greatest possible area while keeping visual fidelity to the original image. The algorithm proposed is dependent on halftoning for the selection of a set of modified pixels. The concentration of pixels and its corresponding luminance are optimized to minimize a visual distortion metric subject to a constraint in the probability of error. After acquiring the image and calculating its luminance from the RGB components, the decoding process is done.

V. PROPOSED SYSTEM

Embedding method consists of two components.
First is the use of halftononing technique, for the selection of modified pixels to break and reduce the coarse structure of Qr code. Second is the luminance level to which the pixels are to be transformed in such a way that it should not be visible to naked eye on the color image.third is to secure dada in the embedded image and noise removal of it.

VI. EMBEDDING TECHNIQUE

The QR code embedding technique introduced here, encodes the QR code value on the luminance values of the image. The first is the use of technique called halftoning which is used for the selection of modified pixels allowing to break and reduce the coarse square structures of the code.The second process is the modification of the luminance levels to minimize the image distortion.

VII. DIGITAL HALFTONING

Digital halftoning is a process for generating images with gray levels called as binarization process. The digital halftoning technique preserves the appearance of the original continuous-tone images and hence can be referred to as perceptually lossless image coding. Halftoning method creates visual codes called halftone codes which combines half tone image with QR codes. After obtaining the image, luminance from the RGB components are calculated and finally the decoding process is done. In the binarization stage, the gray scale image captured by the camera is segmented into black and white pixels. This technique distributes modified pixels of qr code image.

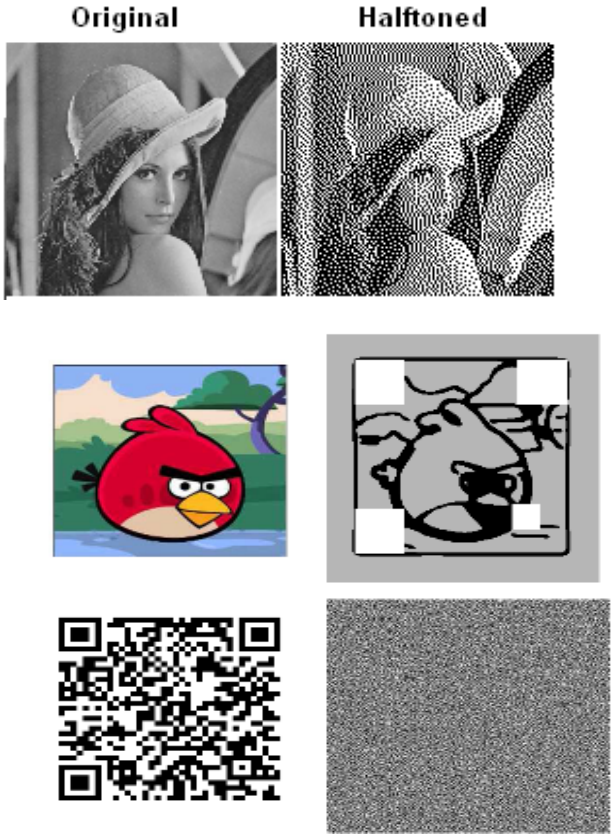

Fig. 1 Halftoning process

VIII. PIXEL SELECTION AND MODIFICATION OF LUMINANCE

Pixels at the center of the QR module are used for a correct decoding. After selecting the pixels, its luminance is modified to one of four possible levels α. This transformation changes the luminance of the pixels that are selected according to the halftoning. The pixels at the center of the QR module are assigned different luminance levels, because they help in decoding with greater accuracy.

IX. COLOR OPTIMIZATION

Goal is to embed the codes into color images, we need to find correct corresponding color vector for each modified luminance. The HSL color space is selected because it iswith simpler computations than other color spaces .The original color is transformed into the HSL color until reaching the desired luminance.

x. DATA SECURING AND NOISE ELIMINATION

After obtaining the color optimized image that is embedded color image,it is possible to retrieve data by smartphones(decoding) directly from color image itself. This data can be made secured by encrypting data in it so that,it can be made available to only authenticated person and to improve the visual clarity image can be enhanced by the elimination of disturbances present in the image.

XI. METHODOLOGY

This project aims at the above goals by following steps.

a) Read the Input Image.
b) Read the QR code.
c) The Algorithm will then embed the QR code into the input image by using Halftoning Mask.
d) Color optimization
e) Securing and elimination of noise from the embedded image.

After embedding qr code into the color image,expected out put is as shown the following figure .

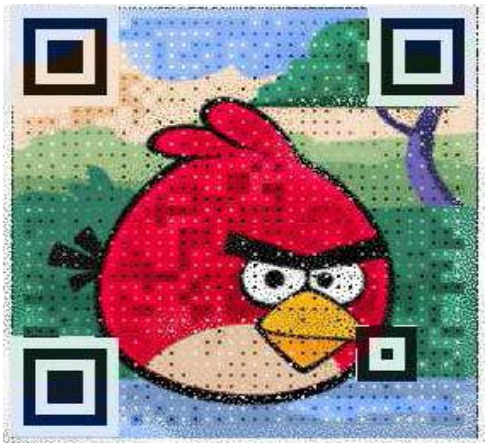

Fig. 2 Embedded result

XII. CONCLUSION

To avoid the visual distortion of the images.are implementing this project. This .present an edge enhancing .version of the new method. This will show that the edge enhanced halftoning gives satisfactory results for some particular types of images. In addition to the use of halftones to diminish the visualdistortion of the embedding; the method presented here definesa quality metric which considers color tone and structural similarity used to select the optimal luminance of modifiedpixels.With standard decoding applications these embedding are designed to be compatible and can be applied to any color or grayscale image with full area coverage. At the QR detector wavelet transforms are used for the optimization and to yield the best possible combination of transformation parameters for each particular image and thus error free image can be obtained.

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