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# A Review on an Approach for Image Localization and Denoising of Quick Response Barcode Using Edge Detection Algorithms

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**ABSTRACT:** Quick Response Code is one type of 2D barcode. QR Code has been widely used in many fields. The research has proposed a complete preprocessing system for restring low-quality Quick Response code images. De-noising will be done on slightly rotated code images. The system will be designed to deal with low contrast and slightly rotated code images. In existing systems, if any scratches are present in QR code the decoding algorithm is unable to decode. Current research will be implemented using multiple techniques to overcome the problems. The main advantage of this proposed system will be to restore the code efficiently. This research work will be implemented on a database composed of a number of images. Barcode technology is essential in automatic identification and used in wide range of real time applications. Different code types and application impose special problems, so there is a continuous need for solution with improved performance. Current research propose a new algorithm through which research has found there contours and their cancroids.

**KEYWORDS**: Edge Detection, Morphological Operation, Gradient Method, FIP's

## I. INTRODUCTION

An image may be defined as a two- dimensional function, *f*(x, y), where x and y are spatial coordinates, and the amplitude of *f* at any pair of coordinates (x, y) is called the intensity or grey level of the image at that point. When x, y and the intensity values of *f* are all finite, discrete quantities, we call the image a digital image. Digital image processing is the use of computer algorithms to perform image processing on digital images. The concept of image processing deals with the conversion of an image into its corresponding digital form and on that digital form we can perform various operations as required. In this process the input provided by us is an image which can be a video frame and the output generated after processing will be an image or some property of that image. Mostly images are treated as two dimensional signals and we apply various signal processing techniques on these signals. Basically three steps are included in image processing starting with importing of the required image, then applying different processes on it and then generating the required output.

### QR CODE

QR code was developed in response to the requests made by the users that they want a barcode that could hold more information and has the capability to code Kanji and Kana characters like alphanumeric ones. It was developed by a team at DENSO WAVE in one and half year. A QR code is capable of coding about 7000 numerals and has the capability to code Kanji characters as well. QR codes can be read 10 times faster than other codes.QR code is a short stand for quick response code as the creator intended the code to allow its contents to be decoded at high speed. QR Code is a two-dimensional symbol.

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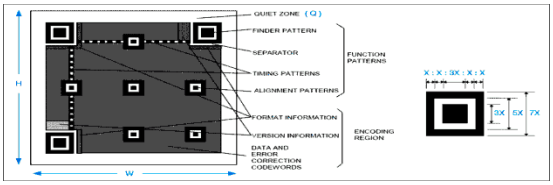
**STRUCTURE OF QR BARCODE**




**structure of QR barcode**

## II. LITERATURE SURVEY

**Ashna Thomas *et. al*. (2013)** They analyzed that Quick Response Code is one types of 2D barcode. QR Code has been widely used in many fields. They proposed a complete preprocessing system for restoring low-quality Quick Response code images. The system has been designed to deal with low contrast, rotated and deformed code images. If any scratches are present in QR code the decoding algorithm is unable to decode. There removal technique consists of multiple processes. .

**Priyanka Gaur et. al. (2014),** 2D barcodes are able to store more information vertically and horizontally. Aztec and QR code are some commonly used 2D barcodes. Appearance of all these barcodes is similar but their encoding is in different formats. The digital cameras in cell phones have let users decode barcodes instead of carrying scanner with them which is difficult. This paper provides a method to recognize a barcode image that is taken by a cell phone using image processing techniques. The platform used here is MATLAB. Results are acceptable and almost all 2D barcodes have strong edge connectivity between them. A new 2D QR barcode recognition technique is proposed by this paper.

**Manpreet Kaur *et. al.* (2014)** This paper explains de-blurring, geometry correction of the code and localization of 2D QR bar codes. The captured image can be blurred due to various factors, it can be motion between camera and the image. So QR reader cannot read such a blurred image. To make QR reader read such an image, the image should first be deblurred. Two methods namely Weiner De convolution method and Lucy Richardson are used for deblurring and localization of the barcode. If we compare the two methods Lucy Richardson method is better as its speed of execution is more than Weiner De convolution method. To deal with geometry of the code distortion of QR barcode Simulink Model is used.

## III. PROBLEM DEFINITION

The code which is 2 dimensional is always in horizontal and vertical positions. There are 3 finder patterns to identify data save points. FIP's provide us the location of the barcodes. They also identify the different types of problems in barcodes. When image is captured in real time it may be blurred and if it is blurred than we have to deblur it. There may be noise in the captured image and we have to denoise it using an appropriate technique. The image captured in the real time may be of any angle, it may be at 0 degree or any other angle. We have to find out finder patterns at different angles.

## IV. PERFORMANCE METRICS TO BE USED

QR code is a 2 dimensional code which contains the information in both horizontal and vertical directions. We have to search the finder patterns (FIP's) to evaluate the values stored in QR code. There are 3 FIP's in each QR code. In our suggested work we are finding the FIP's using their centroid values. In our study we will analyzed 10 samples of QR code by moving them at various angles from 0 to 150 with 30 degree step size. Each sample is taken at three pictures resolutions of 320*240, 640*480, 1280*960.It makes a data set of 180 pictures whose ground truth values for centroids are known. We will implement our suggested algorithm on all the samples. We had calculated the detection rate and error rate for all 180 samples by comparing them with the ground truth values.

5.1.1 Detection Rate: we are searching for 3 FIP's in each QR code. If we found all the three FIP's our detection rate

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will be 100%.

5.1.2 Error Rate: Error rate is predicted by the difference of centroids positions found and Actual centroids positions present in Ground truth table.

## V. CONCLUSION

The main goal of this work was to find the finder patterns(fip's).in 2d QR rcode before extraction of (fip's) we had done some pre processing on our images in pre processing we deblure the motion blure presented in capture image then denoise .it using deconvolution method..to find our fip's we used a edge detection techniqus called a gradient method and morphological thinning after that we identified the connected objects then their centroids using 3 overlapped centroids we found our (FIP's) . After that we have calculated average rate and detection rate. This work is performed on various angles and dimensions of the picture. We had find better result then already presented techniques and work will be uswful in real time applications where QR code are used.

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