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Image Based Multiple Bar-Code Detection System

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*Abstract:-*In this paper Barcode detection method and systems are typically configured for reading each barcode individually. However, it an often advantageous to read a plurality of the barcodes (or a batch of barcodes) in a single scanning operation. Thus we design an algorithm to segment the barcodes of multiple products from a single image and decoding to identify the details of the product. The algorithm will be implemented in a desktop computer using matlab and a performance analysis will be done.

Keywords—Barcodes, Matlab, segmentation and Decoding.
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I. INTRODUCTION

A barcode detection system for simultaneously detect a group of barcodes, comprisinga handheld barcode reader comprising an imaging device and a processing unit said the barcode reader being response to a activation device is a device configure to the generate an activation signal in response to a first action of a user; said barcode reader is configured to a scanning operation in theirresponse to said activation of signal; said imaging device is configured to scan a plurality of barcode during said scanned operation; said processing unit is configured to perform at least the following: generate one or more image represented said plurality of barcodes; detect and decoded said the plurality of barcodes within said one or more images thereby obtaining data in respect of they each barcode from said plurality of barcodes; and in case a plurality of images are generated, compare between barcodes within different images based on said data in respect of each of said plurality of barcodes ; eliminate multiple decoded the data originating from theirsame barcode within an scanned area, which is scanned during said scanning operation, said multiple decoded data resulting fromrepeated detection of said same barcode in more than oneimage of said plurality of images; and maintain a single data copy for each barcode in the scanned area.

II. RELATED WORK

[1]In this paper, we discuss about the implementation of the bar code detection using matlab based on initiating a scanning operation in the response of an activation signal generated by an activation device in response to a first action of a user and provide simulation result. This barcode detection module is based on scanning a plurality of barcodes, by an imaging device, during said scanning operation; generating one or more images representing said plurality of barcodes; detecting and the decoding said plurality of barcode within said one or more images thereby obtaining data in respect of each barcode from said plurality of an barcodes.In case a plurality of images are generated, comparing between barcodes within different images based on said data in respect of each of said plurality of barcodes; and eliminating multiple decoded data originating for their same barcode within a scanned area, which is scanned during said scanning operation, said multiple decoded data resulting from repeated detection of said same barcode in more than one barcode on image of said plurality of images; and maintaining a single data copy for each barcode in the scanned area.

[2]The barcode detection system of claim 3 further configured to calculate said location of said image in respect of said scanning area based on the location, in respect of said scanned area, of barcodes in other images which are identical to barcodes in said image.The barcode detection system of claim 3, wherein said location of a barcode and said location of an image are determined as coordinates in respect of said scanned area.The barcode detection system of claim 1, wherein the barcode detection system is associate with an data storage of unit, and where in said processing unit is configured to store said group of data in said data storage unit. The barcodedetection system of claim 4 wherein said processing unit isconfigured for storing said group of data in asingle record in said data storage unit. The barcode detection system of claim 1, wherein the barcode reader further comprised a field of view selector, said selector is configured for selecting a preferred field of the viewoutof a plurality of available fields of view. The barcode detection system of claim 8 wherein said field of view selector is configured for adapting a focus to the selected field of view.The barcode detection system of claim 8 wherein said field of view selector is configured for changing a zoom of the imager and adapting a focus to the changed zoom. The barcode detection system of claim 8 wherein said field of view selector is configured for changing a zoom by replacing the lens of the imager with one or more alternative lenses having a different focal distance. The barcode detection

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system of claim 1, wherein said barcode reader further comprises a display for displaying information in respect of said one or more images.

[3] Barcode Length Calculation: The barcode initially consisting of a quite zone at each end points a barcode'quiet zone is required thinnest bar lines in at least 10 times wider than its bars.
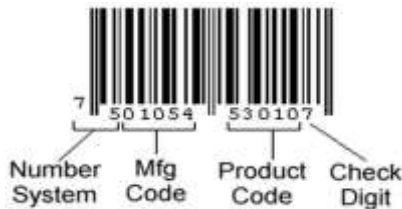

Fig: EAN-13 Components

Table 1
Barcode encoding of code 39

ASCII character	Width encoding	Barcode encoding
0	0000011	101010011
1	0000110	101011001
2	0001001	101001011
3	1100000	110010101
4	0010010	101101001
5	1000010	110101001
6	0100001	100101011
7	0100100	100101101
8	0110000	100110101
9	1001000	110100101
- (Dash)	0001100	101001101
$	0011000	101100101
: (Colon)	1000101	110101011
/ (Slash)	1010001	110110101
. (Point)	1010100	110110101
+ (Plus)	0011111	101100110011
Start/stop A	0011010	101100101
Start/stop B	0001011	101001001
Start/stop C	0101001	100100101
Start/stop D	0001110	101001001

III. PROPOSED WORK

In this paper, we will initiate the image consist of multiple bar codes at first we have to apply Hough transform, by figuring outfit we are going to analyze the multiple bar codes in an image. Then align it in a propend position and then a segment to the multiple bar codes and encode the bar codes by input working algorithm then analyze it and perform a decoding process.

A. Block diagram
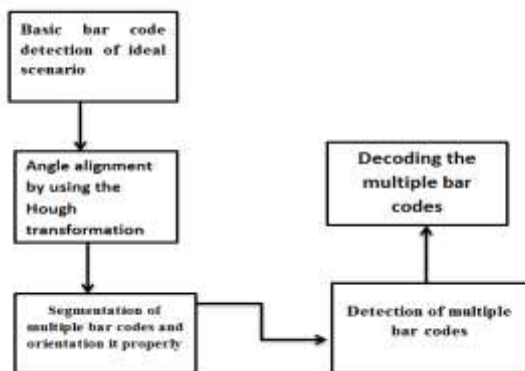
This block diagram shows that data transmission takes place from basic bar code detection to angle alignment through Hough transformation and segmentation of barcode is made to orient properly and detection of multiple barcode is donethrough proposed algorithm, now it is possible to

decodethe data using data of multiple bar codes using decoding algorithm.

HOUGH TRANSFORMATION

This techniquewasfeature extraction method used to detect lines and finding arbitrary shapes position of the image is used in the field of computer vision and image processing. A line can be detected by formula y=mix+k, their main idea of an Hough Transform. Then the vertical lines are present in image then the values of m will be infinity, so use parameters are (r, θ). The parameter r represents the distance between lines and origin (center), θ is the angle of vector from an origin to their point. so, the equation is

$$r = x \cos\theta + y \sin\theta$$

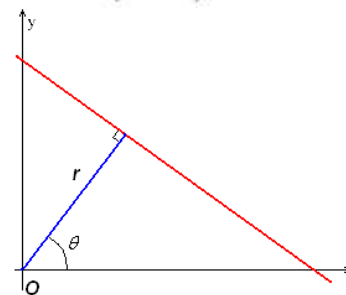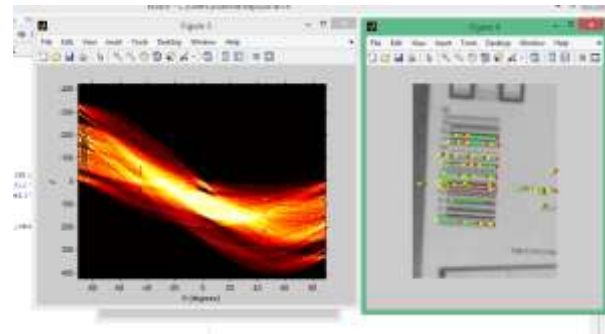$$y = \left(-\frac{\cos\theta}{\sin\theta}\right)x + \left(\frac{r}{\sin\theta}\right)$$

Fig: Parametric description of a straight line.

B. Algorithm

Step 1: Obtain the data by taking snapshot of all products
Step 2: Add angle alignment using Hough transformation
Step 3: Transfer the DATA for segmentation
Step 4: Data will be detected using Bounding boxes
Step5:Barcode decoding task consists in exploiting the information provided
Step6: Barcode detection algorithm to reads barcodes that appear in a given image

C. Formulae:

$$OA^e{}_D = \frac{Tp}{\overline{Tp+FN+fp}}$$

Where

D=dataset

Tp=number of barcode rotations

Tp+fn = total no. of barcodes

fp =no. of objects wrongly identified

Iv.EXPERIMENTAL RESULTS

Encoding process:

In encoding process initially, we make a line on the image which consisting of a barcode.
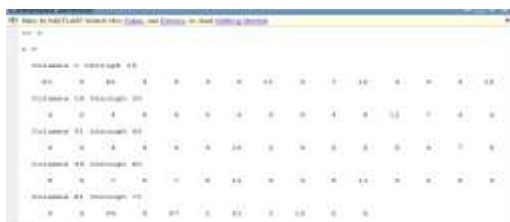

Fig: Encoded image captured by camera

Fig: Encoded bits for given image

Hough transforms:

The Hough transform applied for an image having to barcodes that results as in this we know the how much angle it tilted and where it is we can figure it out easily
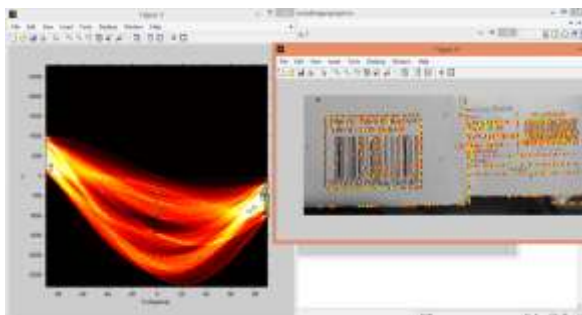

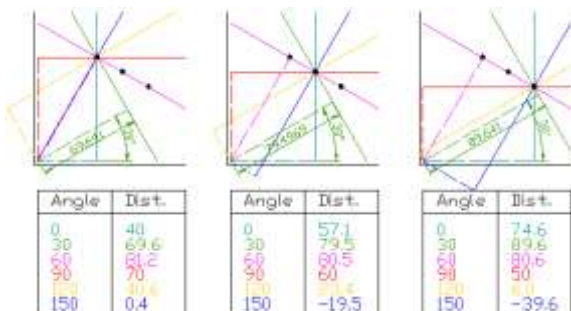Fig: Hough transformation for two barcodes on image

Fig: Hough transformation table out the angle and distance

Segmentation process:

After apply Hough transformation the segmentation is required for the decoding purpose

Decoding process:

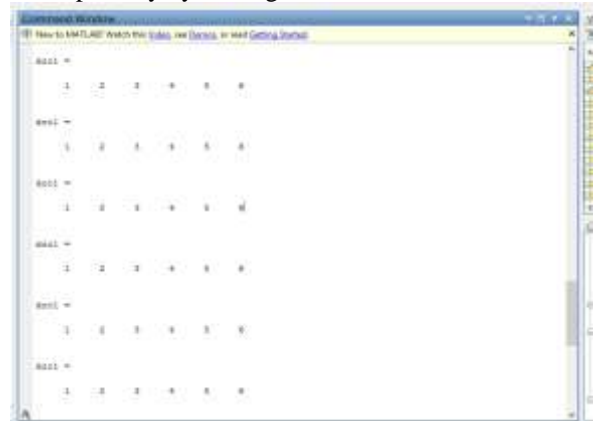After segmenting the decoding is applied for each barcode separately by this algorithm results shows
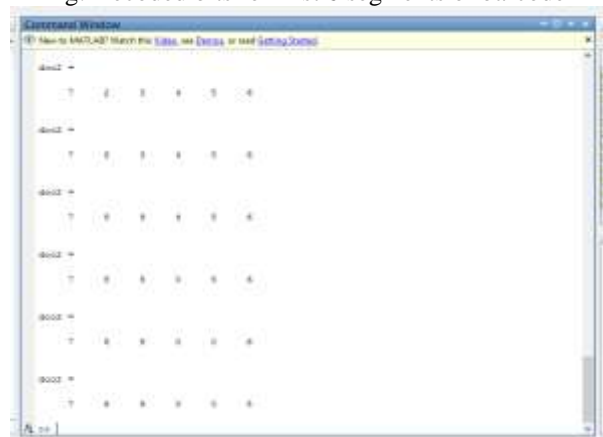

Fig: Decoded bits for first 6 segments of barcode

Fig: Decoded bits for second 6 segments of barcode

V.CONCLUSION

In this paper, details of the implementation multiple detection of barcodes by encoding and decoding data based on Matlab as well as simulation results are provided. In this approach, the data is angled and segmented and detected using algorithm and decoding of multiple barcodes are made within short period of time.

VI.References

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