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A Novel Algorithm for Detecting Currency Notes

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Abstract-- The automated method for identifying Indian currency notes is conceived in this paper and checks whether they are false or original. In banking systems and other fields, the automated machine is very useful. The falsified currency bills in India are increasing by 100, 500 and 2000 rupees. If the technologies such as scanning, color printing and duplication increases, the issue of counterfeiting is the. This paper uses image recognition to recognize false Indian currency notes. This paper uses image recognition to recognize false Indian currency notes. The image acquisition is performed in this technique first and pre-processing applies to the frame. Smoothly and change the image to grey after conversion while pre-processing the image segmentation then extract features and minimize, then compare the image and include the outcome of false or actual currency.

Keywords-- Scanning, Color Printing.

I. INTRODUCTION

In many applications like the automated machine for selling products and the automatic machine for counterfeit Indian currency bill, automatic recognition is significant. The authentic Indian currency note is detected with this device. The system consists of eight stages, including the acquisition of images, grey scale, and edge detection, extraction of features, picture segmentation, photo comparison and performance.

Automatic machines in banks are better since banks face the issue of fake currency bills or bills which were burned. Thus the method of note identification is smoother and more organized for the unit. In order to detect fake currency note in any country the automated system is more relevant. The method for checking Indian currency Notes 100, 500 and 2000 Credit is growing, with the most value currencies available to date being Rs. 2000 and Rs. 500, which are the largest counterfeit. Fake money has been circulated in society

for a few years, along with the original currency, and the general stability of society has been unbalanced. There is still a lot about the transaction.

Many applications, such as automated sale of commodities and vending machines, include automatic methods of identification of banknotes. A variety of modules, such as image recognition, fragmentation, proper retrieval and comparison of pictures, are part of the solution. The simple approach is to remove the features from which we can identify the counterfeit note. In order to acknowledge Indian currents in a variety of fields, including banks, ATM machines, shopping mall, bus terminals, and train stations, automated technology is very necessary.

In these days, technology has evolved exponentially. The banking industry, thus, also becomes new every day. This means that the automatic counterfoil identification of false currencies and the automated machine for selling products is really necessary. Many scientists were urged to create rigorous and effective Auto tracking system for currency [3-7]. Automatic system now usable for the identification of banknotes usage of new food distributors, such as sweets, soft beverages, bus bottles or train tickets. The Face Currency recognition technology is essentially intended to recognize and remove visible and unseen Currency note characteristics

The remainder of the paper has been organized: The literary analysis of the planned work is provided in Section 2. The architecture of the design is included in Section 3. The algorithm used for the proposed work is illustrated in Section 4. The findings are discussed in section 5 and the work Concludes in section 6.

II. RELATED WORKS

G Howells [1] identified a room-temperature scans magnetic microscope of new design that can be used in a range of print processes at a spatial resolution of several microns to store

image information on magnetic inks. In inspection of currency notes and credit cards we propose that this picture technique can see general use. Nur Syahidah Yusoff [2], says that more knowledge than univariate time series can be given in the multivariate time series. The passion of this paper is therefore to compare the effects of two related methods, mean and RV coefficient of Escoufier in building similarity matrices of 20 world currencies. Both matrices are used, thus, to replace the network topology correlation matrix needed. We can detect the superiority of the currency for both networks with the aid of the centrality index.

In order to detect fake currencies through the application of various techniques and procedures, the fake currency detection system is developed. This note should be recognizable easily and accurately by the fake currency identification machine. Money notes on either hand should be recognizable by the false currency identification machine. In locations such as supermarkets, banks counters, automatic tellers, auto-seller machines, etc, a currency recognition system may be used.

III. METHODOLOGY

Here, the first step in the workflow series is always the image acquisition in image processing since no processing is possible without an image. If the image is taken, various imaging processes may be used to perform various visual tasks on the image. There are different ways to get pictures, including using the camera or scanner. All features should be preserved for the acquired image.

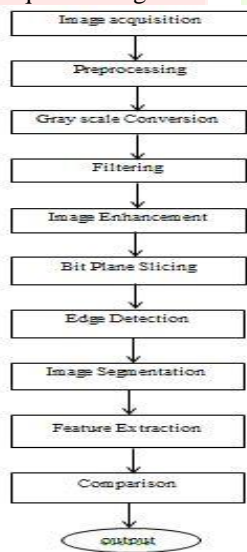


Figure A: Flow chart for Proposed method.

A. Pre-processing:

The key aim of the pre-processing process is to enhance the optical quality of images and the handling of data sets. The image pre-processing, also referred to as image reconstruction, includes the correction in the imaging phase of distortion, loss, and noise. Interpolation is the method used mostly to zoom, rotate, and shrink and geometric corrections. Noise removal is an essential step in the manufacturing. But noise has an effect on segmentation and matching patterns.

B. Image Adjusting:

The scale of the image is too huge if we take the image from a scanner. We decrease the image size in order to reduce the estimation. The adjustment of the image is done using the interpolation of images. Interpolation is the method used mostly to zoom, rotate, and shrink and geometric corrections.

C. Image smoothening:

Convolution is used to smooth pictures. The medium filter, which is more efficient than convolution if the aim is to reduce the noise conservation borders at once, can also smooth the image. A median filter substitutes a pixel over all the neighborhoods' median pixel.

D. Gray-scale conversion:

The picture obtained is colored by RGB. In grey scale it contains only the strength information that is simple to process rather than three R (Red), G (Green) or B elements (Blue).



Fig 1: Gray-scale image.

E. Edge detection:

Edge detection is a fundamental tool for the processing and visioning of images, particularly for the detection and extraction of characteristics, which seeks to distinguish points of a digital image where the brightness of the image varies dramatically or has discontinuities more formally. Border identification is a basic step in the creation and interpretation of images, the perception of image patterns and the machine vision.

F. Feature Extraction

The special method of dimensional reduction is the extraction of features in pattern recognition and image processing. It is the way to collect the visual content for indexing and retrieval of images. If the input data to an algorithm are too big to process and are thought to be notoriously redundant (many, but not much) then the input data is converted into a reduced function range (also named feature vector).

Mahatma Gandhi Portrait segmentation centered on edge, as seen above, attributes extracted are carefully selected, the attributes set are required to extract valid information from the input data such that the desired work can be done using the reduced representation rather than the full size input. The extraction feature means that the sum of resources available for the description of the vast data set is simplified.

IV. ALGORITHM

Step 1:

Image Acquisition: Importing image from the dataset to test the Currency.

Step 2:

Performing Image pre-processing techniques such as:

- Image Adjusting: Reduces the calculations and complexity of the size of the image and used for rotating, zooming, shrinking and for geometric corrections.
- Image Smoothing: Reduces the noise introduced in the image.

Step 3:

Detect the edges of the note and partition it from the surrounding background of the image.

Step 4:

Perform Feature Extraction on the note to detect whether the note is real or fake by comparing the features of the note with the stored database. There are two databases, one consisting of fake serial no's, so when the image is captured, the captured image's serial no. is compared with the fake serial no's database and the result is displayed and the other database consist of the images of the features except for serial no.

Step 5:

After Feature Extraction the application will detect and recognize the note.

Step 6. The final result will be displayed.

V. RESULTS AND DISCUSSION

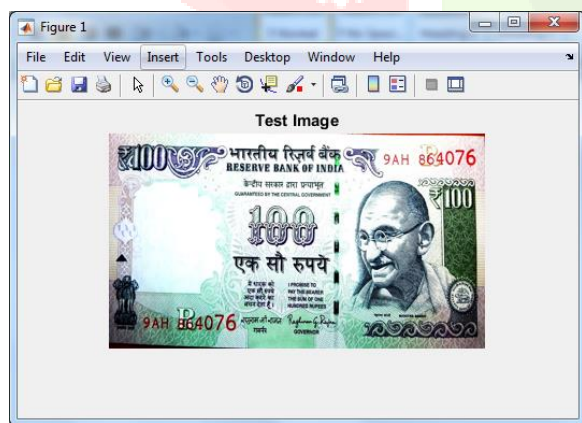


Figure 2: Input Test Image

The image of currency is taken as input in order to detection whether it is genuine or fake.

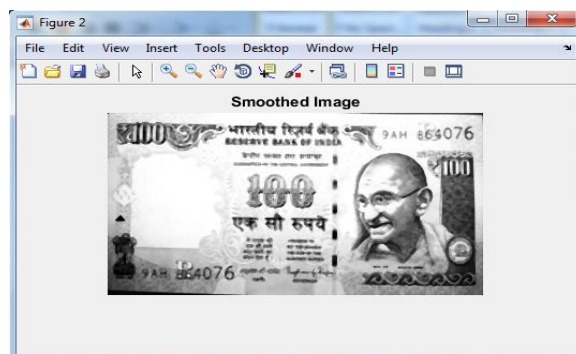


Figure 3: Smoothed image

The input image is smoothed by converting the color image into gray scale image using image processing process.

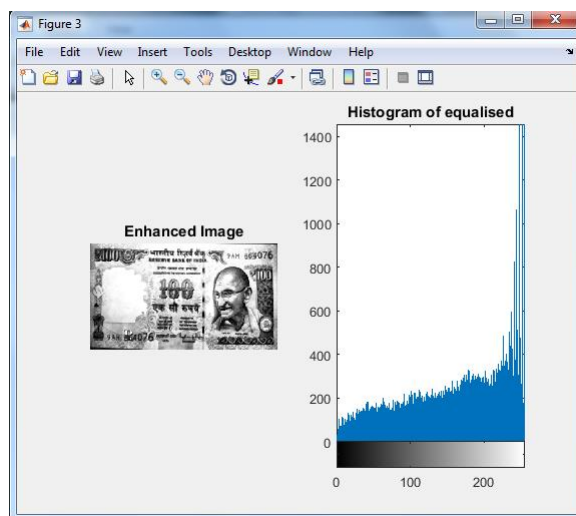


Figure 3: Enhanced Test image and Histogram equalization

The gray image is enhanced using the enhancement process and the histogram equalization is derived using the equalization concept.

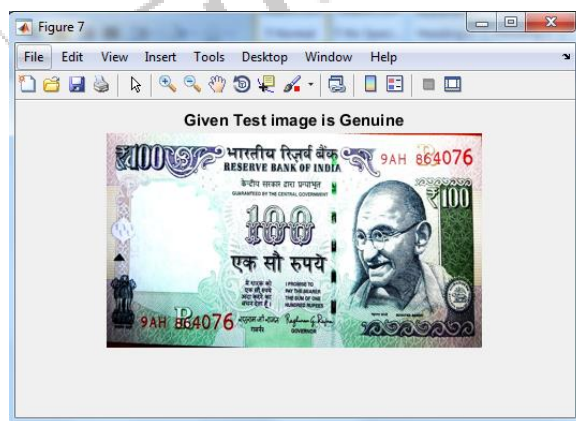


Figure 4: Output Image

Then finally by using the edge detection techniques and image matching process the prediction is done whether the image is fake or real.

VI. CONCLUSION

The analyses of currency images using digital image processing are reliable and effective relative to current

technologies with respect to cost and time use. For this study, use MATLAB software. Testing activities in this area are increasing day-to-day and different image processing technologies are being put in place to achieve a more reliable outcome. Efficient extraction of Indian currency photos is carried out with the proposed method. Currency image functionality extracted can be used for identification and authentication of the currency value. The key driving force behind this project was to have a device to detect genuine and fake easily and quickly.

VII. REFERENCES

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