Fake Indian Currency Detection Using Image Processing

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ABSTRACT: Fake currency is a burning question throughout the world. The counterfeiters are becoming harder to track down because of their rapid adoption of and adaptation with highly advanced technology. One of the most effective methods to stop counterfeiting can be the widespread use of counterfeit detection tools/software that are easily available and are efficient in terms of cost,reliabity and accuracy. The software detects fake currency by extracting existing features of banknotes such as micro-printing, special identification marks etc.

This paper proposes a system that can classify and subsequently verify Indian paper currency using fundamental image processing techniques. It uses the comparison between the input banknote and the calculated reference values for different parameters of original banknotes in a similar environment. This system maintains its simplicity while still having high accuracy of 100% for classification and 90% for validity verification.

KEYWORDS: Fake notes, Image Processing, Design extraction, counterfeit detection.

I. INTRODUCTION

All economic activities relating to production, distribution, consumption etc. can be motivated by money. Savings and investments can be made in the form of capital information. Thus, money is important in the dynamic society for everything. As our economy is moving towards the development there are many other things which are downsizing it. One of those things is production and usage of forged bank notes.

The worst hit of this action is mostly average citizen as fake banknotes have become deeply embedded in the Indian economy that even bank branches and ATMs are disbursing counterfeit currency. From petrol stations to the local vegetable vendor, everybody is wary of accepting banknotes in denominations of Rs.500 and Rs.100 as a majority of them are almost impossible to tell from genuine banknotes. The usual effect of counterfeit on economy is inflation.

Automatic recognition of fake Indian currency note is important in many applications such as automated goods seller machine and automated goods tellers machine. This system is used to detect the valid Indian currency note. The system consists of eight steps including image acquisition, grey scale conversion, edge detection feature extraction, image segmentation, comparisons of images and output.

II. LITERATURE SURVEY

- 2016 International Conference on Electrical Power and Energy Systems (ICEPES) – "Automatic Recognition of Fake Indian Currency Note".
  In this paper result is obtained by performing image processing Operations. In the system image acquisition is done by using the camera and acquired image is send to the processing unit. In this roposed system input is taken by CCD camera and output is displayed on PC.

- International Journal of Scientific Research Engineering &amp Technology (IJSRET), "Indian Paper Currency Authentication System using Image processing".

In this article, the authentication of Indian paper currency is described by applying image processing techniques. Basically six features are extracted including identification mark, security thread, watermark, numeral, floral design, micro lettering from the image of the currency. The process begins from image acquisition and end at comparison of features.

After authentication, the serial number of the note is extracted. The use of serial number extraction is if any counterfeit note is encountered we can immediately send the report about that counterfeit note. The features are extracted using edge based segmentation by Sobel operator and works well in the whole process with less computation time.

III. RELATED WORK

In this project we are designing Fake currency detection using image processing for this, first we acquire the image for further processing from the saved database .Database is consist of 117 images of particular currency. then we adjust the size,rotation of our acquired image to our required level for processing. Average image is the image which is the average of 117 images in database.after this design extraction is also performed. Average image is subtracted and noise and same part of features is calculated and saved.For unique feature,features are extracted.

IV. BLOCK DIAGRAM

The proposed block diagram for the fake currency detection is as follow. There is only requirement of camera or scanner and PC or laptop as hardware device. The pc or laptop must have MATLAB software installed and version for the MATLAB must be R2013a or further versions.
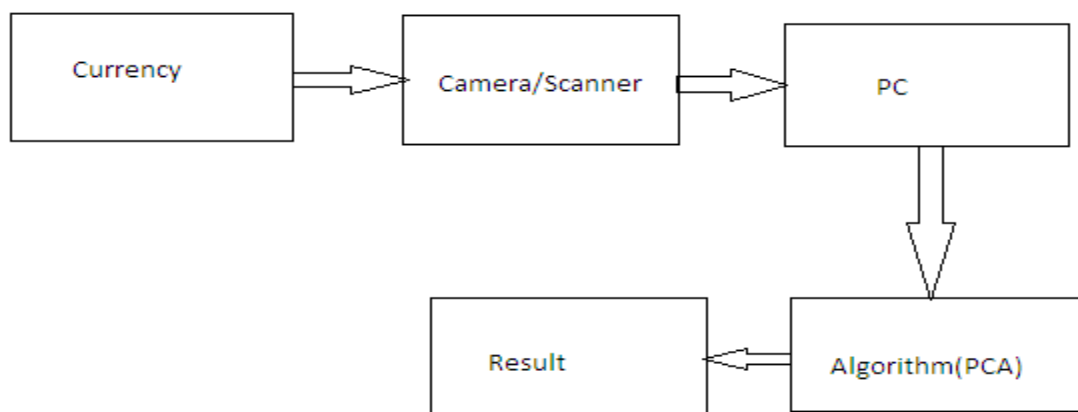

Fig. 1 Block Diagram

Currency:
The Indian rupee is the official currency of the Republic of India. The issuance of the currency is controlled by the Reserve Bank of India. The Reserve Bank manages currency in India and derives its role in currency management on the basis of the Reserve Bank of India Act, 1934. The rupee is named after the silver coin, Rupees.

Camera/Scanner :
A camera is an optical instrument for recording or capturing images, which may be stored locally, transmitted to another location, or both. The camera is a remote sensing device as it senses subjects without any contact . The functioning of the camera is very similar to the functioning of the human eye. A camera works with the light of the visible spectrum or with other portions of the electromagnetic spectrum.

PC:
A personal computer (PC) is a multi-purpose computer whose size, capabilities, and price make it feasible for individual use. PCs are intended to be operated directly by an end user, rather than by a computer expert or technician.
On the pc we install MATLAB software. MATLAB is used for the image processing.

Algorithm:

The coding is based on the PCA technique. Principal component analysis (PCA) is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. The number of distinct principal components is equal to the smaller of the number of original variables or the number of observations minus one.

Result:

Result is finally displayed as note is valid or not valid.

V. SYSTEM SPECIFICATION

- **Laptop:**

Dell Inspiron 5559 , 15.6-inch Laptop ,(Intel Core i5-6200U/8 GB/1 TB/Win 10/AMD Radeon R5 M335 4GB DDR3

- **Image Acquisition Unit:**

Camera is used for image acquisition. It will take picture of incoming note and picture is forward to processing unit. After suitable image processing signal will be produced.
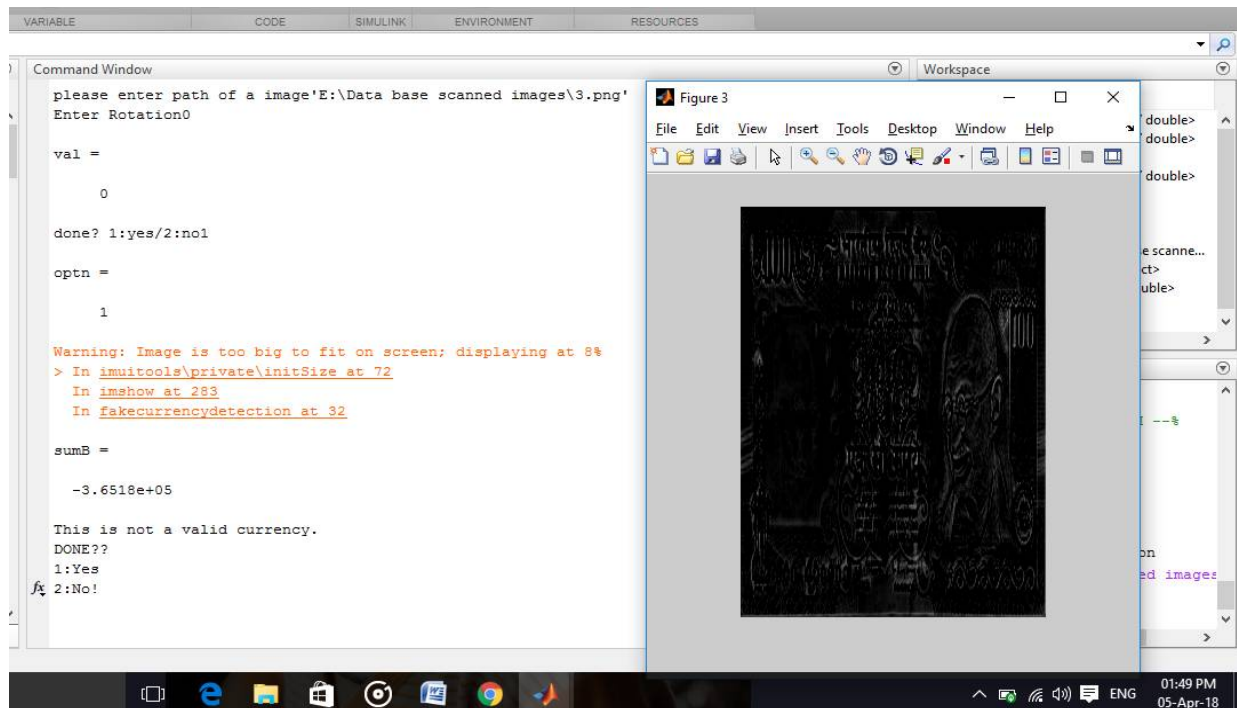
Camera: 640x1136 pixels, 12MP,2160P

- **MATLAB**: R2013a

VI. RESULT

1.For invalid currency:

After run the programm , in the command window you have to enter the path for the currency image. Then check for the rotation, if rotation is not ok then rotate the image. If the currency is invalid then it shows the result as follow:

2.For valid currency:

After run the programm , in the command window you have to enter the path for the currency image. Then check for the rotation, if rotation is not ok then rotate the image. If the currency is valid then it shows the result as follow:
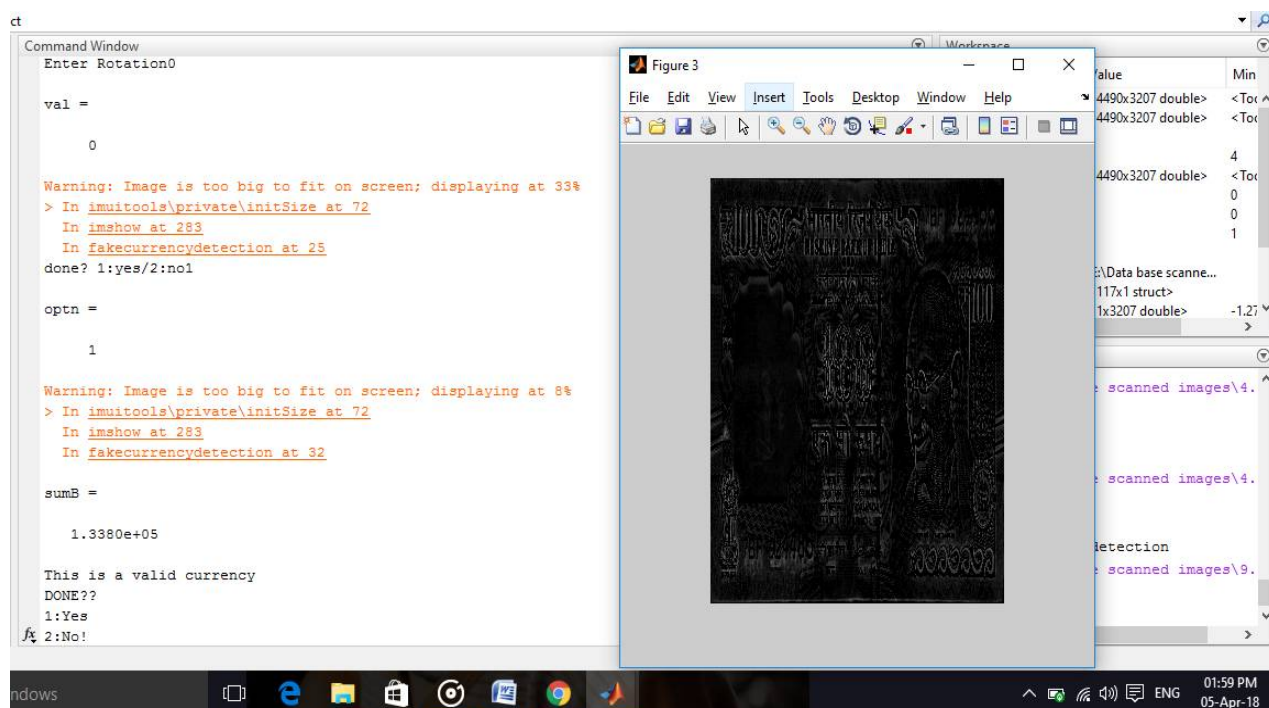
VII.CONCLUSION

Here we use image processing in our project of "Fake Currency Detection" And after completing the project we can find that the particular currency is Valid or Invalid.

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BIOGRAPHY

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