# Survey Paper on Detection of Fake Currency using Android Application

**Prof. Ms. R. B. Ghate[1] Pavan Chavhan[2] Aditi Padole[3] Kalyani Marwade[4] Jayshree Chambhare[5]**
[1]Assistant Professor
[1,2,3,4,5]Department of Computer Engineering
[1,2,3,4,5]Bapurao Deshmukh College of Engineering, Sewagram, Wardha, India

*Abstract—* Fake currency recognition is done by using android application for creating the application android studio is used. RBI Earlier fake currency detection was done by using image processing but in that hardware is required. Now in this we are using software application. The image goes for segmentation. In this digital image converts into multiple segments afterwards goes for comparison in that we are comparing different parameters of notes with real currency which is present in our database. System compare images of currency note to the stored images of original currency of notes images .To provide cheaper and accurate system to the user which can easily accessible and gives accurate recognition of currency notes.

*Key words:* RBI, Currency, Detection

## I. INTRODUCTION

Reserve bank of India (RBI) has a sole has right to issue currency notes in India. Every year RBI faces the problem of counterfeit currency. The problem of increasing fake currency in India is a serious issue which has to be take care of. In recent years there has been a considerable increase in quantity of fake Indian rupees notes. The government in July 2017 had informed the parliament that fake currency having a face-value of over Rs.11.23 crore was detected in 29 states post demonetization. The Reserve Bank of India (RBI) in its latest annual report said that during 2016-17, 762,072 pieces of counterfeit notes were detected in the banking system, of which 95.7 percent were found by commercial banks. Counterfeiters have become so talented that they know how to make a fake copy of even the newest printed currency note and they do it so well that it becomes very difficult to identify these fake notes. Counterfeit stands for illegal photocopying of original currency. Counterfeit is a fake currency it has not authorized by the government. A survey made by the National investigation Agency in year 2015 stated that there were around 400 crore rupees in Indian economy which were fake. But the report prepared by the Intelligence Board stated that almost every year, total of 2500 core rupees fake currency comes in Indian market.              Detecting of fake currency was categorize into six modules including Image capturing, Image pre-processing, Gray scale conversion, Edge detection, Segmentation, Feature extraction every steps required   algorithm for which we are using openCV library (open source computer vision library) and android studio for creating application. Working of whole process from image capturing through feature extraction are detailed given in methodology whether note is fake or real.

## II. LITERATURE REVIEW

Currency counter provides a fast efficient and accurate way to count stacks of currency some models detect counterfeit bills either magnetically and using ultraviolet light. Ultra violet light detector is used in currency counter a currency created a color copier printer produce and image that reset on surface of paper that can easily UV light is place over it. Tiny particle of toner outsides the image can also see in with a UV light built into the machine. If counterfeit bills are run through the machine alarm or light will alert u that the back note is counterfeit machine automatically detect and match the piece again already program component of legitimate bills.

NeeruRatheeet.al. [2016][1] have purpose image processing algorithm have been Mark which have been adopted as security features of Indian currency. Fake currency detection is serious issue worldwide, affecting the economy of almost every country including India. The possible solution are to use either chemical properties of the currency or to use its physical appearance. To and accurate, the decisive score of all the three features has been fused to differentiate between real and fake currencies.

SonaliDaradeet.al. [2014][2] have purpose in this paper, recognition of fake Indian currency notes is done by using image processing Technique. The atomatic system is designed for identification of Indian currency notes and cheack whether it is fake or original. In this system input is taken by CCD camera and output is displayed on pc.

KameshSanthanumet.al. [2013][8] have purpose the growth means of fake and counterfeit currency is evident as newspaper report of a huge cache of fake currency notes being sized appear every day. One is using Ultra Violet (UV) detection using lab view; the other using the polarization of light when passed through the currency.

D. Alekhyaet.al. [2014][5] have purpose the MATLAB technique deployed with a scanner or a camera so that it will detect fake notes which gives the power to a common man to control fake Currency circulation in our country. Our paper enables a layman to identify a fake note and empower every Citizen to detect fake notes which may reduce corruption in our country. Some of the effect that counterfeit money has on society include a reduction. In the value of real money, and inflation due to more money getting

## III. PROPOSED WORK

Manual testing of notes in transactions is very time consuming and confusing process and also there is a chance of tearing while handling notes. Therefore automatic methods for bank note recognition are required in many applications such as automatic selling goods. In the proposed system, an approach for fake currency detection extracts the general attributes the latent images and identification mark from image of currency. Extracting attributes from images of currency note can get quite complex as it involves the extraction of some visible and invisible features of Indian currency. In this chapters includes the features extracted so far may be categorized as general feature. The security features are extracted using various images processing techniques algorithm and then matching is done to identify

fake currency. The outline of proposed work is presented in system block diagram.

### A. *Methodology*

There are following modules for detection of fake currency include image capturing, image pre-processing, grey scale conversion, edge detection, image segmentation and feature extraction, etc. are discuss below in brief [1].

#### 1) *Image Capturing*

The first stage of any vision system is the image capturing. Once the image is captured with the help of camera .It will take the image of the size that he want so he cropped required image from a given captured image. It is first step in the work flow sequence, without and image, no processing is possible capturing image should retain all the features. Then it will goes through the next stage that will be image pre–processing stage

#### 2) *Image Pre-Processing*

In this image pre–processing stage the image which comes for image capturing stage .In this we remove irrelevant, inconsistent noisy data. The noises, light are removed from the image. For example, the given image contains brightness because of that image is not see clearly. Then this image pre-processing will increase the contrast .so that the image will clear or if the image contain contrast then for seeing the proper image it will increase the level of brightness. These types of noisy data are will remove in this stage or in image pre-processing stage.
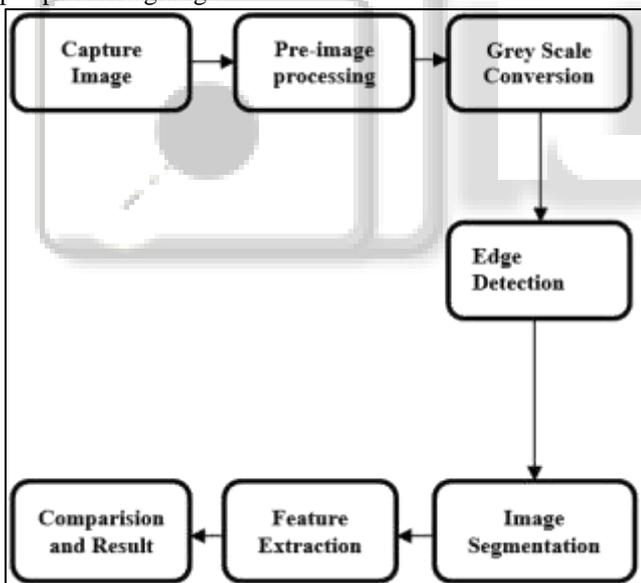


Fig. 1: Block Diagram of Currency Detection

#### 3) *Gray Scale Conversion*

Here, image comes from image pre–processing stage. The image we captured is in RGB format so to convert it into gray scale conversion we required certain algorithm .here we used binarization algorithm for converting RGB into Gray Scale Format. Instead of processing three components, R (Red), G (Green), B (Blue). To take RGB values for each pixel and make as output a single value reflecting the brightness of the pixel. In this algorithm binarized the input image, useful for cleaning background noise in a text image to be input to OCR. Binarization converts gray scale (0 upto 256gray levels) into black and white image (0 and 1). The high quality binarized image can give more accuracy as compared to original image.

The selection of most optimal binarization algorithm is difficult because different binarization algorithm gives different performance on different data set.

#### 4) *Edge Detection*

Edge detection is the name that identifies the points in a digital image at which the image brightness changes sharply or more formally. The point at which image brightness changes sharply are typically organized into the set of curved line segment term as edges. In this stage the edge detection is an image processing technique for finding the boundaries of and object within an image .For detecting the boundaries we are using Canny's edge detector algorithm .It is an edge detection operator that uses a multiple stage algorithm to detect a wide range of edges in image. The process of Canny's algorithm are,

1) Apply Gaussian filters to smooth the image in order to remove the noise.
2) Find the intensity gradient of the image
3) Apply non-maximum suppressing to get rid of spurious response to edge detection.
4) Apply double threshold to determine potential edges.

#### 5) *Image Segmentation*

In image segmentation is the process of converting a digital image into multiple segments (sets of pixels, also known as super-pixels). The goal of segmentation is to simplifying and /or change the representation of an image into something that is more meaningful and easier to analyze. Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images. The image segmentation is set of segments that collectively cover the entire image, or a set of contours extracted from the images (see edge detection).Each of the pixels in a region are similar with respect to some characteristic or computed properly, such as color, intensity or texture.

#### 6) *Feature Extraction*

Feature extraction is the specific form of amplitude reduction. It is method of capturing perceptible image for retrieval and indexing. It makes simple the amount of facility recovered to describe the large amount of set of data. Then the output is display on that currency faith or currency is fake or real.



Fig. 2: Features of Indian Currency

## IV. ADVANTAGES

− The application will prove very beneficial to detect fake currency.
− The application is a freeware, user friendly and easily accessible.
− It will save time, reduce the effort of the user..
− It supports an easy implementation as it is less expensive and easily accessible.

## V. CONCLUSION

Detection of fake currency based on android application is presented. This system aims to simplify the task of identifying fake currency. Here we are detecting currency is fake or real by certain step applying on it due to this we find easy to detect fake note or currency by comparing with our database stored in database.

## REFERENCES

[1] NeeruRathee, RajatSachdeva, Maharaja Surajmal Institute of Technology New Delhi, INDIA, "On Feature Fusion for Fake Indian Currency Detection", Email ID:neeru1rathee@gmail.com 978-9-3805-4421-2/16/\$31.00 c2016 IEEE.

[2] Sonali R. Darade, G.R. Gidveer Department of Electronics and Telecommunicatio Engineering, JNEC "Automatic Recognition of Fake Indian Currency Note" Email ID:daradesonali@gmail.com, 978-1-5090-2476-6/16/\$31.00c 2016 IEEE.

[3] Prof. RenukaNagpure, Shreya Sheety, TruptiGhotkar, "Currency Recognition and Fake Note Detection", IJIRCCE, Vol-4, 2016.

[4] VibhutiVashishtha and Md. Sadim "A Paper Currency Recognition System Using Image Processing To Improve the Reliability with PCA Method", International Journal of Engineering Science & Research Technology. ISSN: 2277-9655 Vol-1 Issue: 1, 2015.

[5] D. Alekhya, G. DeviSuryaPrabha and G. VenkataDurga Rao, "Fake Currency Detection Using Image Processing and Other Standard Methods", International Journal of Research in Computer and Communication Technology, Vol 3, Issue 1, January- 2014.

[6] Rubeenamirza and veentinanda, "Design and Implementation of Indian Paper Currency Authentication System Based on Feature Extraction by Edge Based Segmentation Using Sobel Operator", IJERD, Volume 3, Issue 2 (August 2012), PP. 41-46.

[7] P.M. Deborah, SoniyaPrathap.M.E −"On Detection of Fake currency using Image Processing", International Journal of Innovative Science, Engineering & Technology, Vol. 1 Issue 10, December 2014.

[8] KameshSanthanam, SairamSekaran, SriramVaikundam and Anbu Mani Kumarsamy, "Counterfeit Currency Detection Technique using Image Processing, Polarization Principal and Technique", 2166-8531/13 \$26 ©2013 IEEE.

[9] R. C. Gonzalez and R. E. Woods, Digital Image Processing, 2nd ed., Prentice Hall India, ISBN-81-203-2758-6, 2006.M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.