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AUTOMATIC COUNTERFEIT CURRENCY DETECTION USING IMAGE PROCESSING

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Abstract - *Automated currency detection is a cardinal tool for banks as for common people. Affording currency detection machine for a common man can be arduous. Panacea for this is to create an app which will be nimbly available for everyone. Our main aim is to make work easy and help people to check the originality of the currency on their mobile phone easily. When currency is blurry or in damaged condition it will be laborious to find the originality of the currency.*

***Key Words*: Counterfeit notes, pixcel to pixcel extraction, image processing, java code.**

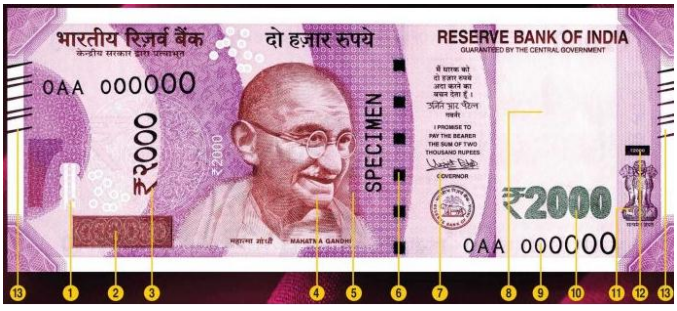
1. INTRODUCTION

Counterfeiting currency became root cause of corruption which is adversely infecting Indian economy. So we came across an android application which will automatically detect the originality of currency, result will be accurate and not time consuming. We are using contrasting and segmentation method which will help to find the forged position of the currency and show its result in android phone.

Proposed algorithm is based on histogram technique and parallel approaches are used to increase the performance of the system. All the operations are done by the Server and sends required result to the android phone through Wireless Application Protocol (WAP).

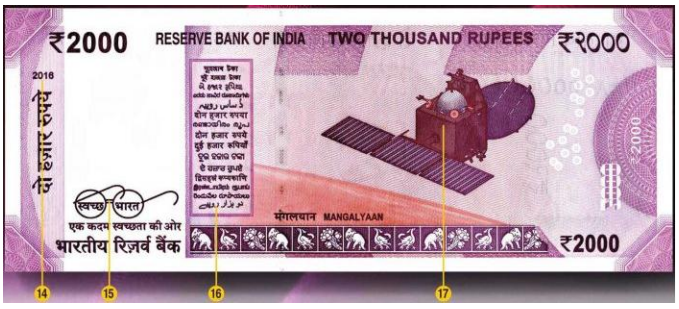
2. FEATURES OF 2000 AND 500 CURRENCY NOTES

Rs. 2,000
(Colour: magenta)
Is a part of the Mahatma Gandhi (New) series, with a motif of India's Mars orbiter, the Mangalyaan on the reverse
Size: 66mm x 166mm



Front side:

1. See through register with denominational numeral 2000.
2. Latent image with denominational numeral 2000.
3. Denominational numeral २००० in Devnagari.
4. Portrait of Mahatma Gandhi at the centre.
5. Micro letters 'RBI' and '2000' on the left side of the banknote.
6. Windowed security thread with inscriptions 'भारत', RBI and 2000 on banknotes with colour shift. Colour of the thread changes from green to blue when the note is tilted.
7. Guarantee Clause, Governor's signature with Promise Clause and RBI emblem towards right.
8. Mahatma Gandhi portrait and electrotype (2000) watermarks.
9. Number panel with numerals growing from small to big on the top left side and bottom right side.
10. Denominational numeral with Rupee Symbol, ₹2000 in colour changing ink (green to blue) on bottom right.
11. Ashoka Pillar emblem on the right.
12. Horizontal rectangle with ₹2000 in raised print on the right.
13. Seven angular bleed lines on left and right side in raised print.



Back side:

14. Year of printing of the note on the left.
15. Swachh Bharat logo with slogan.
16. Language panel towards the centre.
17. Motif of Mangalyaan.

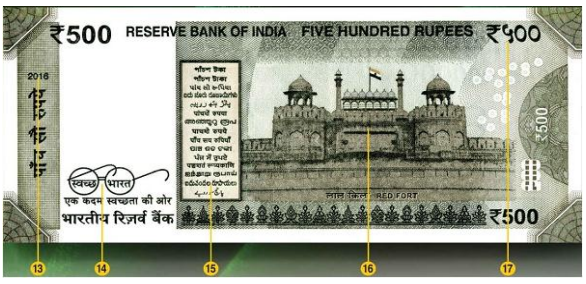
Rs. 500

The size is 63mm x 150mm, colour is stone grey with Red Fort and Mahatma Gandhi's image on each sides of currency.

Feature:

Front side:

1. See through register in 500 denomination numeral
2. Denomination numeral's latent image
3. Denomination numeral in Devanagari lipi can be found
4. Mahatma Gandhi's portrait orientation and relative position is changed
5. Windowed security thread changes colour from green to blue when you tilt the note
6. Guarantee clause, Governor's signature with premium clause and RBI emblem tilted towards right
7. Electrotype and Portrait watermarks
8. Number panel with numerals growing from small to large on top left and bottom right sides
9. On the bottom right denomination numerals with rupee symbol in colour changing ink from green to right
10. Ashoka pillar emblem can be seen on the right side
11. 500 in raised print on the right with circle
12. On the left and right five bleed lines in raised print



Back Side:

13. Printed year on the left side
14. Logo of Swatch Bharat with slogan
15. Language panel towards centre
16. Red fort image with Indian flag
17. Numeral of denomination in Devanagari on the right

3. DESIGN FLOW OF AUTOMATIC RECOGNITION OF GENUINE AND FAKE INDIAN NOTES

3.1.1 Pre-processing

Pre-processing is a familiar name for operations with images at the lowest level of abstraction -- both input and output are intensity images. The aim of Pre-processing is an improvement of the image data that suppresses unwanted distortions or enhances some image features essential for further processing.

3.1.2 Segmentation Proces

Image segmentation is the process of partitioning a digital image into multiple segments (sets of pixels, also known as super-pixels). The goal of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze.

3.1.3 Contrast Checking

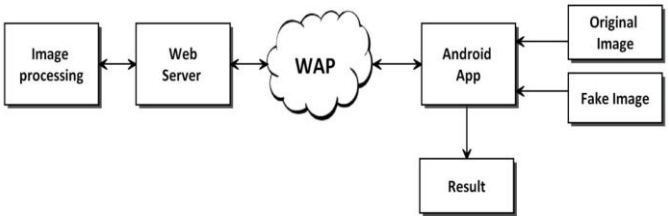
Image processing, normalization is a process that changes the range of pixel intensity values. Application includes photographs with poor contrast due to glare, for example Normalization is sometimes called contrast stretching or histogram stretching.

3.1.4Detection of forgery image

After pre-processing of an image, input image undergoes image segmentation and difference between two images gets displayed on output window.

3.1.5SLIC algorithm

In proposed algorithm the image is first converted into grayscale and then divided into many segments, each pixel will compare with each other. If any difference is found then the image is declared to be forged image

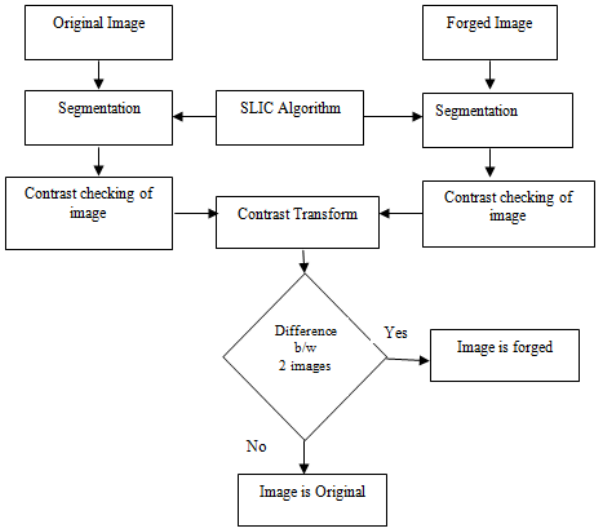


4. Algorithm:

- Assigning integer value for the width of first image (original image) and second image (fake image).
- Convert image into gray scale.
- Get RGB values from first and second image.
- If difference of two images is zero then the image is original or else fake.

The image is converted into gray scale and then the image goes through contrast checking. RGB value of two images is compared and if the difference is zero then the image is declared as original or else fake.

The algorithm will be stored in sever where image processing will takes place and the result will be sent back to the android application.



5. SYSTEM CONFIGURATION

System Requirements:

Hardware Requirements:

1. System : Pentium IV 2.4 GHz.
2. Hard Disk : 500 GB.
3. RAM : 4 GB

Software requirements:

1. Operating system : Windows XP/7.
2. Coding Language : JAVA/J2EE
3. IDE : ECLIPSE
4. Front End : JSP
5. Back End : MYSQL 5.0

Android requirements:

1. IDE: ADT Bundle (Eclipse plug in)
2. SDK: Min level .12 / Max 21

6. RESULTS

The input/given image is compared with the original image and the difference between those images is shown below :

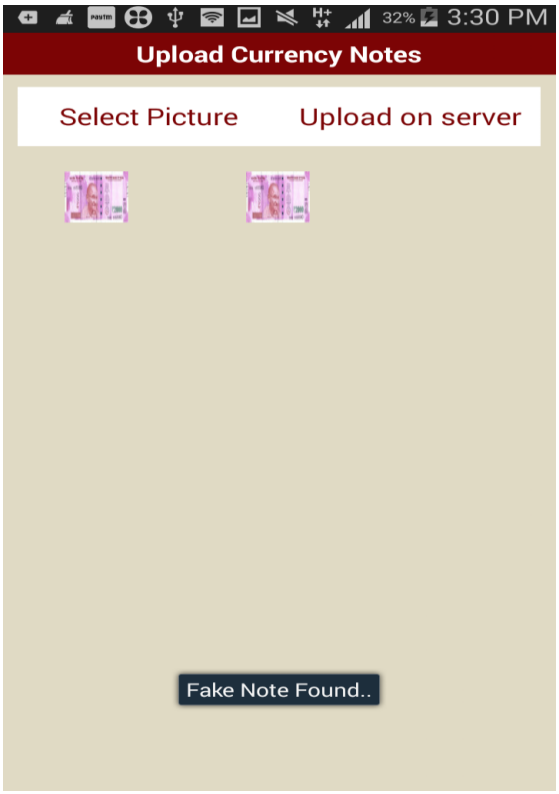
- Original image (stored in data base)

- Input image (image which need to be verified)

- Difference of two images(results of original and input image)

Android App:

In the terminal end android application is created to view the status. To login to the application it is necessary to provide username and password.
When username and password is provided, user is navigated to the home page, here user need to give an input image which need to be verified.



References

[1]. Sagar S. Lawade, Gayatri S. Hedau, Apurva C. Ramgirwar, "Fake Currency Detection Using Image Processing", International Journal of Research in Science & Engineering (e-ISSN: 2394-8299Volume: 1 Special Issue: 1 p-ISSN: 2394-8280)

[2].Binod Prasad Yadav, C S Patil, R R Karhe, P H Patil, "Indian Currency Recognition and Verification System Using Image Processing", International Journal of Engineering Science and Innovative Technology (IJESIT) (ISSN: 2319-5967 ISO 9001:2008 Certified Volume 3, Issue 4, July 2014)

[3].Bhurke, Meghana Sirdeshmukh, Prof. Mrs. M.S.Kanitka, "Currency Recognition Using Image Processing", International journal of innovative research in computer and communication engineering (ISSN: 2320-9801 ISO 3297: 2007 Certified Organization "Currency recognition using image processing" Vol. 3, Issue 5, May 2015)