A Study of Different Counterfeit Note Detection Algorithm

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ABSTRACT -In this paper we have reviewed different fake currency detection systems. The systems are developed using different methods and algorithms. The benefits of this study for the reader are that this study will provide information about the different methods and algorithms used for fake currency detection system. They can compare the detection systems. Detection ability depends on the currency note characteristics of particular country and extraction of features.

KEYWORDS: Image Processing, edge detection,Segmentation.

I. INTRODUCTION

Modernization of the financial system is a milestone in protecting the economic prosperity, and maintaining social harmony. The Reserve Bank of India is only one which has the full authority to issue bank notes in India. But some unsocial group of people are prone to make these fake currencies. Fake Indian Currency of 100, 500 and 2000 seems to have flooded the system and there is no proper way to deal with them for a common person. Common Person fall prey to this currencies.

The value of money is increasing and Rs. 2000 and Rs. 500 is the highest value currency existing till date and maximum fake is done in them. From few years, along with the original currency, Fake Currency is also circulating in the society and unbalancing the social harmony of the society. Many of the transaction are also carried out with it. Fake currency detection means finding fake currency from the currencies.
Fake or Counterfeit notes are one of the biggest problem occurring in cash transactions. For country like India, it is becoming big hurdle. Because of the advances in printing, scanning technologies it is easily possible for a person to print fake notes with the help of latest hardware tools. Detecting fake notes manually becomes time-consuming and untidy process hence there is need of automation techniques with which currency identification process can be efficiently done.

The paper [1] presented by Ying Li Tian describe by **Effective Component-based** Banknote Recognition for the Blind. In this paper ,For the detection of forged notes it needs to identify the denomination every time they use the device which consist of ultraviolet light. The bank employee keeps the paper currency note on the device and try to find whether the watermark identification, serial number and other characteristics of the notes are proper to get the denomination and check its authentication. This increases the work of the employee. Instead, if the banker uses this system, the result could be more accurate . motion blur affects the system performance, thereby true note recognition rate get decreases. Problems can be summarized as follows, i) Motion Blur Problem. ii) Noise imposed by image capture instrument. iii) Different type of note. iv) Less efficient feature extraction technique.The paper [2], presented byMohammad H Alshayeji has a technique to Detection Method for Counterfeit Currency Based on Bit-Plane Slicing Technique. A new approach is presented in this paper using the bit-plane slicing technique to extract the most significant data from counterfeit banknote images with the application of an edge detector algorithm. The proposed technique consists of decomposing original images of 256 gray levels into their equivalent 8 binary images. This is useful in analyzing the relative importance contributed by each bit of the original image. Higher order bit levels are

evaluated for grayscale banknote images with the application of **Canny edge detection algorithm**. The results are then compared with genuine banknotes and with other existing techniques used for detecting counterfeit notes.
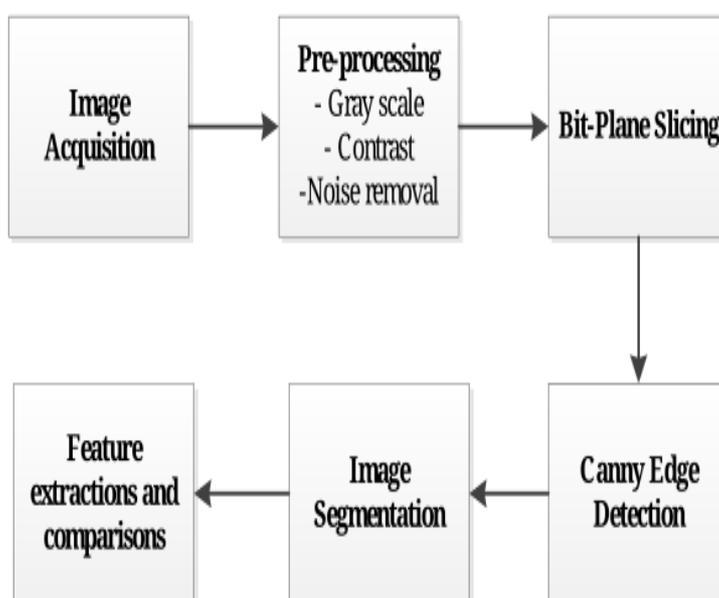

Figure 1. Block Diagram of Counterfeit Detection Process

The paper [3], presented by Nayana Susan Jose and Shermin Siby describe byAndroid Based Currency Recognition System for Blind .This paper is mainly built to support them and make them easier to get used to the currencies. Here, we propose an android based application for recognizing currencies of different countries and also their denominations mainly for visually impaired people. Image processing techniques like feature extraction and matching are used to identify currencies. This application runs on a low end smartphone. We give an audio message as the input to start the app and to capture the image. Then the image is captured and is compared with the test image. If the features of both the images are spatially consistent, then an audio output is given to the user about the denomination of the currency and to which country it belongs to. Otherwise, an error message is given as output.
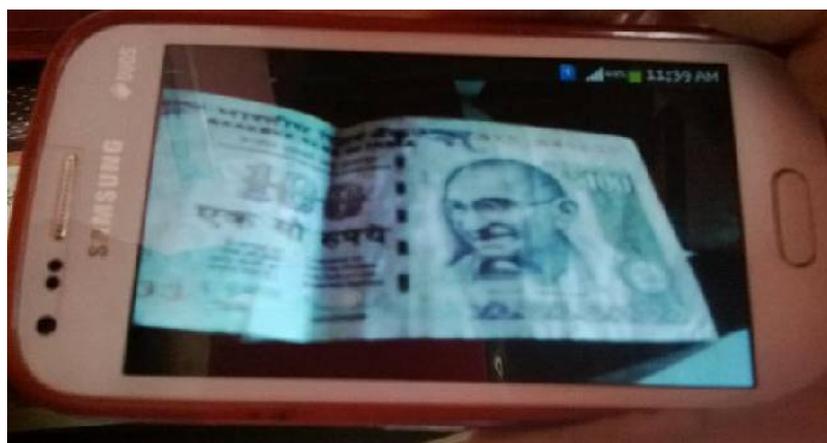
Fig.2. Android Based Currency Recognition System

   The paper [4], presented by Mirza and Nanda describe an Automated paper currency recognition system can be a very good utility in banking systems and other field of commerce. In this article, recognition of paper currency with the help of digital image processing techniques is described. Three characteristics of Indian paper currency is selected for counterfeit detection included identification mark, security thread and watermark. The characteristics extraction is performed on the image of the currency and it is compared with the characteristics of the genuine currency. The **sobel operator** with gradient magnitude is used for characteristic extraction. Paper currency recognition with good accuracy and high processing speed has great importance for banking system. The proposed method has advantages of simplicity and high speed.
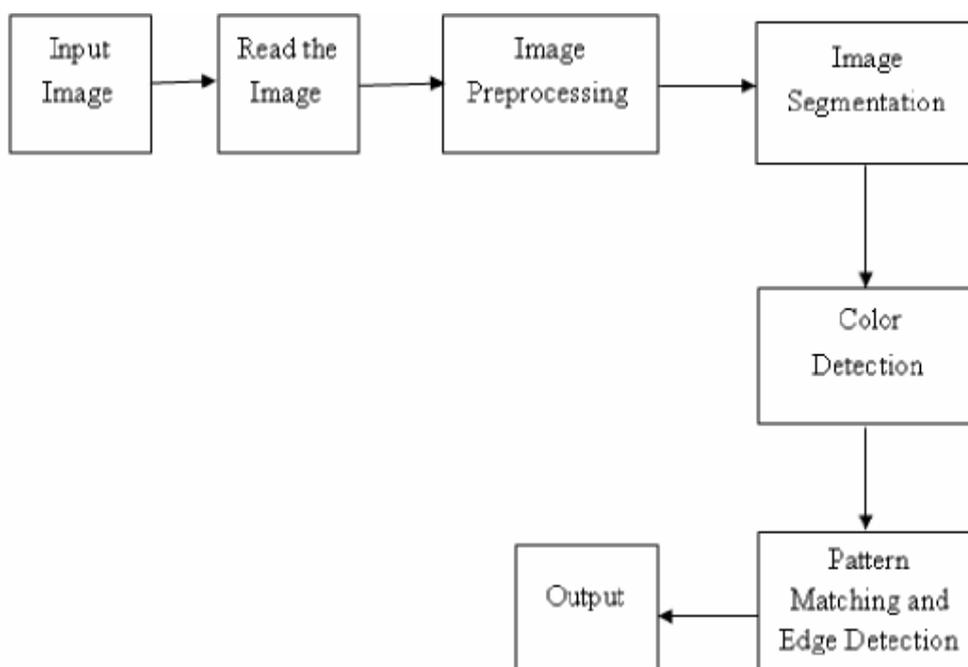

Fig.3 Automated Paper Currency Recognition

IV. CONCLUSION

In this paper proposed a fake note detection using various method. In image pre-processing the image was cropped, adjusted and smoothed. Then the image converted into gray scale. After conversion the edges are detected. Next the image segmentation is applied. After segmentation the features are extracted. Finally compared and find the currency original or fake.The features are extracted using edge based segmentation by sobel operator and works well in the whole process with less computation time. The complete methodology works for Indian denomination 100, 500 and 2000. The method is very simple and easy to implement. This technique is very adaptive to implement in real time world. Not only in banks, could such type of appliances also be used in shops or some other places.

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