Fake Currency Detection

Harsh Vardhan Singh, Harshit Ojha, Nitish Malik

Department of Electronics and Communication Engineering, Galgotias College of Engineering and Technology, Greater Noida, UP, India
Department of Electronics and Communication Engineering, Galgotias College of Engineering and Technology, Greater Noida, UP, India
Department of Electronics and Communication Engineering, Galgotias College of Engineering and Technology, Greater Noida, UP, India

ABSTRACT— Currency recognition is a simple process of identifying the denominational value of a currency. It is a simple job for normal human beings, but for a visually challenged person the currency recognition is a challenging task. The currency detection is a challenging task for the both visually challenged and machines. Moreover, humans can identify currency by the pattern recognizing ability inherently available within them. But currency detection is a complicated task when machines are involved. The input amount is detected and verified. Dataset is prepared and done by collecting dataset of the images of the currencies. All these images are stored in a directory. Detection and recognition process involves reading the image, and then identifying the value of money. In this method pre-processing steps like edge detection and character extraction are involved. After feature is extracted, pattern recognition technique is used to find the value of money.

Keywords— Fake currency detection, Image Processing, MATLAB

I. INTRODUCTION

The aim of our system is to help people who need to recognize different currencies, and work with convenience and efficiency. For bank staffs, there is a "Currency Sorting Machine" helps them to recognize different kinds of currencies.

The main working processes of "Currency Sorting Machine" are image acquisition and recognitions. It is a technique named "optical, mechanical and electronic integration", integrated with calculation, pattern recognition (high speed image processing), currency anti-fake technology, and lots of multidisciplinary techniques

II. PROBLEM STATEMENT

There are approximately 50 currencies all over the world, with each of them looking totally different. For instance, the size of the paper is different, the same as the colour and pattern.

The staffs who work for the money exchanging (e.g., Forex Bank) have to distinguish different types of currencies and that is not an easy job. They have to remember the symbol of each currency.

This may cause some problems (e.g., wrong recognition), so they need an efficient and exact system to help their work.. The problem is bigger than it seems.

III. MODULAR DIVISION

The entire architecture is divided into 4 modules:

A.Read in image
        The system can read not only JPEG (JPG) format but others. Our image was obtained from a scanner. As mentioned before, the resolution is set to 600 DPI.
        But this will make the image a big size. . So, after reading in the image, the system will reset the image to size 1024 by 768 pixels and this work will refer to image pre-processing.
B.Image pre-processing
Image pre-processing is used for operations on images at the lowest level of abstraction.

 The pre-processing does not increase image information content but decrease it if entropy is an information measure. For example, as Histogram equalization, it modifies the brightness and contrast of the image, making the image look clearer.

The other example is to remove the noise on the image and improve the quality of edge detection (image).

C.Matching
Matching is called function template, because we need to get the template. In function Template, it contains a series of templates for different currencies; we get the template based on the serial number.

After the template is finished, matching is performed and the final result is to come

IV. PROPOSED SYSTEM

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 designing of this system one challenging case is to design system that is extraction of characteristics from currency image for accuracy of the automated system.

• Image Acquisition The camera or scanner is used for image acquisition. The acquired image should consist of all the features. 2) Pre-processing In pre-processing the operations normally initial to main data analysis and extraction of information. In this unwanted distortion are suppressed and enhance some image features that are important to further processing. It includes image adjusting and image smoothening. In image adjusting, when the image obtained from scanner the size of image is large therefore to reduce the size of image, image adjusting is used. In this for image adjusting interpolation is used. In image smoothening, while using camera or scanner and perform image transfer, some noise will appear on the image. The important step of removing noise is done by image smoothening. For image smoothening convolution is used.

• Image Segmentation In image segmentation, the image is divided into regions or objects depending on problem the segmentation is done. Segmentation algorithms for monochrome image are based on two basic properties of image intensity.

• Feature Extraction Feature extraction is the specific form of dimensionality reduction. It is the method of capturing the visual content of image for retrieval and indexing. When input to the algorithm is too large to be proceeding and it is having much data but not more information. Then input data will be converted into reduced representation set of features. Feature extraction makes simple the

number of resources required to describe the large set of data [3].

• Comparison In comparison, the extracted feature of input image and extracted feature of original image is compared.

• Output The output is displayed on LCD display. The output is currency denomination or currency is fake or original.
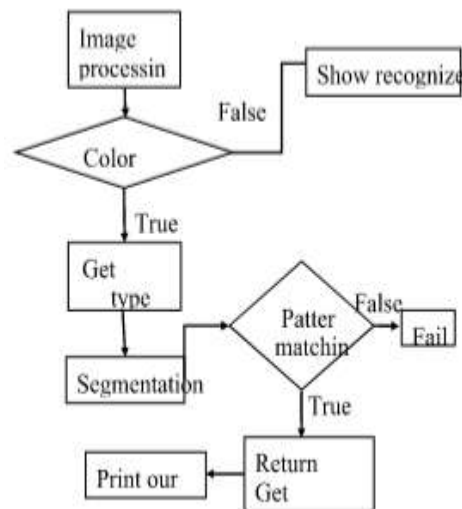

Figure 1, Flowchart of the algorithm

V. CONCLUSION AND FUTUREWORK

Conclusion- This paper proposes an algorithm for recognizing the currency using image processing. The proposed algorithm uses the primary color and a part of currency for recognition We differentiated the denomination of currency using mean value of brightness of R, G and B. This is the first condition to recognize the currency. Following, we segmented the pattern from the currency and performed template matching to check the currency.

The experiment performed by program based on aforesaid algorithm indicates that our currency recognition system based on image processing is quite quick and accurate.

However, such system suffers from many drawbacks. The quality of sample the currency, the damage level of the paper currency will affect the recognition rate. And our system still has some limitations, such as the light condition.

Future work- In the future, we are going to modify our system, overcome some limitation, especially the problem that we get the image from

digital camera and complete our data base for recognizing more currencies.

REFERENCES

[1]. Andrew S. Glassner. Principles Of Digital Image Synthesis. Morgan Kaufmann Publishers, 1995.

[2]. Prof. Renuka Nagpure, Shreya Sheety,Trupti Ghotkar, "Currency Recognition and Fake Note Detection", IJIRCCE ,Vol-4,2016

[3]. Vibhuti Vashishtha 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.

[4]. 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.

[5]. M.Deborah and Soniya Prathap "Detection of Fake currency using Image Processing". IJISET- International Journal of Innovative Science, Engineering & Technology, Vol. 1, Issue 10, 2014.

[6]. Amol A. Shirsath S. D. Bharkad, "Survey of Currency Recognition System Using Image Processing", IJCER, Vol.3, Issue 7, pp 36-40, July 2013.