

APPENDIX1



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CURRENCY REGOGNITION SYSTEM using Image Processing

A Project Report of Capstone Project - 2

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report “**CURRENCY RECOGNITION SYSTEM USING IMAGE PROCESSING**” is the bonafide work of “**SANDEEP GOND**” who carried out the project work under my supervision.

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ABSTRACT

For Developing countries like India, it is turning out to be huge obstacle. As a result of the advances in printing, checking advances it is effectively workable for an individual to print fake notes with utilization of most recent equipment instruments and incredible innovative advances in shading printing, copying and examining, duplicating issues have gotten progressively genuine. In past just approved printing house can make cash paper, however now a days it is workable for anybody to print fake monetary certificate with the assistance of current innovation. Fake notes are consuming inquiries in pretty much every country. Therefore there is a need to structure a cash acknowledgment framework that can without much of a stretch have any kind of effect among genuine and counterfeit banknote. I propose a system for automated currency recognition using image processing techniques. My aim is to help people solve this problem. However, currency recognition systems that are based on image analysis entirely are not sufficient. Our system is based on image processing and makes the process automatic and robust. It also shows the exchange rate of the detected currency with EUR, USD/INR.

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1.INTRODUCTION :

1.2 Purpose

It is difficult for people to recognize currencies from different countries. Our aim is to help people solve this problem. However, currency recognition systems that are based on image analysis entirely are not sufficient.

Our system is based on image processing and makes the process automatic and robust.

1.2 Project Scope

According to the survey conducted by the CIA, there are around 180+ currencies presently circulating in the world. Each of these currencies differs greatly in features such as size, color and texture. Unlike the olden times, the trade and commerce between countries has increased in all sorts of levels. The need for acquiring knowledge about all the currencies by the banks has been extremely important. However for any human teller to recognize each note correctly is something that is not feasible. Thus the need for an efficient automated system that helps in recognizing notes is pivotal for the future.

In this paper, I propose an automated system for currency recognition using Image processing techniques. MY system works for 2 of the most commonly used currencies in our domain.

2. SYSTEM DISCRPTION

Input(Image Acquisition) : A digital camera or scanner or phone is used for image preprocessing. The starting step of the paper currency recognition system would be image segmentation that means separating the note image from the background.

Browsing : Proposed System browse these images file in the system and these image will be given for template matching.

Image processing : It is method to convert an image into digital form and perform some operations on picture or image, in order to obtaining an enhanced image or to extract some useful information from image or picture. Here, we use Template matching for finding small parts of image.

Template matching : It is a technique in digital image processing for finding small parts of an image which match a template image. It can be used in manufacturing as a part of quality control, a way to navigate a mobile robot, or as a way to detect edges in images. Finally, we get output which shows .

2.1 System Background

- ❖ The proposed web portal will help common people for currency recognition anywhere anytime.
- ❖ In this approach system extract the general attributes of the paper currency like various dominant parts of image of currency note (like: objects, binary pixel pattern, etc).
- ❖ The Pixel values help to know the denomination of currency. These values of currency helps to detect objects(photo on currency, value, fake or genuine). The system will be developed to check different currency notes of 1, 5, 10, 20, 50, 100, 200, 500 and 2000 rupees. And 1, 2, 5, 10, 20, 50 and 100 dollar notes.

2.2 Theoretical Background

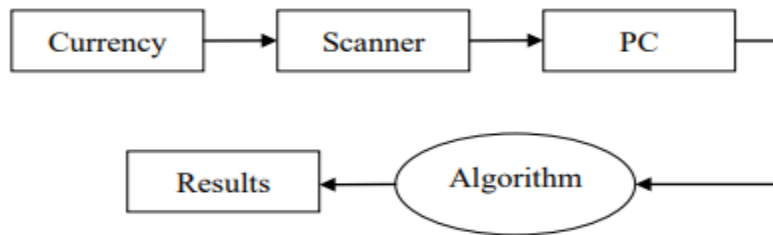


Figure 2.1 Flowchart of the process

2.3 Hardware Configuration

1. Processor : Intel i3 6th gen
2. RAM : 4gb DDR3
3. HDD : 1TB
4. CV

2.4 Software Configuration

1. OS : Windows7 & Windows10
2. PyCarm
3. NumPy
4. Open cv2
5. JSON
6. Requests
7. StarUML

3. FUNCTIONAL REQUIREMENTS :

The system simply extracts feature of currency which were match with original

currency features and immediately displays result with accuracy.

The features which were considered for currency recognition are as follows :

- ◆ Latent image
- ◆ Currency Value Area (1, 5, 10, 20, 50, 100, 200, 500 & 2000)
- ◆ Intaglio printing
- ◆ Identification mark
- ◆ Object images on different currency note
- ◆ Match with template image.
- ◆ Pixel

4. LITERATURE SURVEY :

- Main purpose of the system is to provide currency detection facility. There are lots of machines are available that helps the people to recognize different features of currencies. But for most working staffs in money exchange have to keep a lot of different features and anti-fakes label for different commonly-used currencies. Existing systems uses optoelectronic device to produce the signal from the light refracted by the banknote.
- Debnath et al. , they had used ensemble neural network for currency recognition. Negative correlation learning is used to train the individual Neural Networks (NNs) in an ENN. There are different types of notes such as noisy and old notes and the machine does not easily recognize such notes. Therefore, a system developed using ENN can identify them easily and correctly. For testing, they had used notes of different dominations, which are of 2, 5, 10, 20, 50, 100 and 500 TAKA. First, they convert the note image into gray scale and then the image is compressed. Then the compressed

image is given to system as an input for recognition. The system developed using ENN can easily identify the currency with noise as well as old currency notes. With independent training, there are less chances of misclassification.

- Qing and Xun , they had used two problem-solving techniques (Artificial Neural Networks and Gene Algorithm). Due to the slow convergence and indeterminate initial weights for Back Propagation Neural Networks, they had used Gene Algorithm. The purpose to use the Gene Algorithm is to get the appropriate result of connection weights and network connection. The GA-BP (Gene Algorithm: Back Propagation) takes short training time and a great recognition speed therefore it is used for image processing.
- Jahangir and Raja , they had used neural network recognition method to recognize Bangladeshi currency. They had implemented this method on cheap hardware that can be used in different places. The system takes the image of banknote as an input. The notes are scanned using less expensive sensors. The notes are trained for recognition using Back Propagation algorithm. If the note is flipped, the correct recognition is guaranteed because the axis symmetric mask is used in preprocessing stage. For experiment notes, they used eight notes of TAKA, which were recognized successfully.
- Guo et al. , they proposed Local Binary Pattern (LBP) algorithm for paper currency recognition. For recognition of currency notes, it is necessary to extract features with good quality. For characteristic extraction, they had proposed LBP algorithm, which is based on LBP method. The LBP method has advantage of simplicity and high speed. This method recognizes currency.

5. CONCLUSION :

- In this technique, the authentication of currency is described by applying image processing.
- Basically some features are extracted including various domination parts of note (like identification marks of the currency).
- The features are extracted using image based segmentation using template matching and works well in the whole process with less computation time.
- The complete methodology works for different countries currency notes. The method is very simple and easy to implement. This technique is very adaptive to implement in real time world. The process begins from image acquisition and end at comparison of features.

6.REFERENCES :

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