

FAKE CURRENCY DETECTION SYSTEM FOR VISUALLY IMPAIRED

Aiswarya V A¹, Krupa P², Suhana I³, Sujatha S⁴, Sreelatha P K⁵

¹Dept of Computer Science & Engg, Sai Vidya Institute of Technology ,(India)

²Dept of Computer Science & Engg, Sai Vidya Institute of Technology ,(India)

³Dept of Computer Science & Engg, Sai Vidya Institute of Technology ,(India)

⁴Dept of Computer Science & Engg, Sai Vidya Institute of Technology ,(India)

⁵Dept of Computer Science & Engg, Sai Vidya Institute of Technology ,(India)

Abstract:

Technology has been evolving exponentially with time but along comes its adverse effect. One of them being the currency notes. There are lot of counterfeit or fake currencies doing rounds in the society. The major who fall prey to this are the visually impaired. In the proposed system we aim to provide a helping hand to the visually impaired to detect the fake Indian currency and prevent them from being deceived. This paper proposes a system that uses image processing techniques and KNN algorithm. The output is provided in the form of audio which specifies the amount if its a real currency .

Keywords: Fake currency detection ,pi camera, raspberry pi

I. INTRODUCTION

In India, the sole authority to issue currency notes of all denominations is for the Reserve Bank of India. Fake notes does not possess the genuine characteristics of the real Indian currency. The increase in the circulation of fake currency notes has vastly affected the value of real notes as well as diminish the growth of our economy.

Due to manual errors in the fields where huge amounts of cash transactions are conducted, makes the necessity for increase in automation of transactions in the various sectors such as banking . With development of modern banking services, automatic methods for paper currency recognition become important in many applications such as vending machines. It is very difficult to find different denomination notes in a bunch.

Because of the new sophisticated technologies used in printing and scanning it has become easy for a traitor to print fake notes with the help of advance hardware and tools.

Major consequences of counterfeit notes on society are the reduction in the value of real money, increase in prices due to more money being circulated in the economy and decrease in acceptability of money. Common man has become a prey to the counterfeit currency and the major affected are the visually impaired who are getting deceived . Identifying fake notes manually has become very intensive and time consuming process, hence there is need of automation techniques with which currency identification process can be efficiently done.

The purpose of this paper is to help the visually impaired in identifying counterfeit notes.

A blind person at some places of money exchange have to distinguish between different types of currencies and that is not an easy job. They have to remember the symbol of each currency. This may result into wrong recognition, so they need an efficient and full proof system.

As the need of the hour, it is essential to help the visually impaired recognize the real currency so that they can be independent and not get deceived from the counterfeit notes.

Hence , aim of our project is to a develop a system that work with convenience and efficiency to identify the fake currencies for the visually impaired. This thesis proposes an image processing technique for paper currency recognition. The feature extraction is done using KNN algorithm.

II. LITERATURE SURVEY

REFERENCE	TITLE	CHARACTERISTI CS	STRENGTH	WEAKNESS
[1]Anilkumar B and KRJ Srikanth (2018)	Design & development of Real Time Paper Currency Recognition System of Demonetization New Indian Notes by Using Raspberry Pi for Visually Challenged.	Raspberry Pi embedded board,included with pi camera. k-Nearest Neighbors (k-NN) for recognizing each classes of banknote are used.	KNN is used to classification after that to find the ROI (rate of investment) in the dataset images.	The correctness of banknote location and banknote esteem acknowledgment are 88% and 100%, individually.
[2] Venkata Sai Teja. D1, A Krishnamoorthy, P Boominathan (2018)	Indian currency recognition and speech synthesis for visually impaired persons.	Mainly concentrated on the area of “Image Processing” using MATLAB and Raspberry Pi. This project is mostly a hardware based project that uses the MATLAB software.	MATLAB was being used as Image Processing features as an operational project .	The features extracted was converted to text but to speech,it wasn’t synthesised properly

[3]PilaniaE.,A rora B (2016)	Recognition of fake currency based on security thread feature of currency	Security Thread	Pattern Recognition and Neural network technique based on ROI and HSV.	It takes more time for detecting whether its fake or not .
[4] YingLi Tian et. Al (2012)	Effective Component based Banknote Recognition for the Blind	Effective Component based.	The proposed algorithm achieves 100% true recogni- tion rate and 0% false recognition rate.	Motion Blur Problem
[5] Mohammad H Alshayjeji et. Al (2015)	Detection Method for Counterfeit Currency Based on Bit Plane Slicing Technique.	Canny Edge Detect or color	the edges obtained using bit-plane sliced images are more accurate.	Multimedia and Ubiquitous Engineering
[6] Nayan a Susan Jose et. Al (2015)	Android based Currency Recognition System for Blind	Mobile camera based with internet .	The methods used works on blurred images captured using a mobile phone	Camera quality is low. internet is required

III. PROPOSED METHOD

With the increasing of incidence of money counterfeit from year to year as a result of technological advances, many ways have been used to detect forgeries however still we are dependent on the presence of a machine and equipment that are sometimes less effective and need more time. The process of identification is done by comparing the original images of money that will be tested with reference of original currency paper image and the currency will be compared by using KNN (K-nearest neighbor) technique.

The most effortful phase is to design system, that extracts characteristics from currency image for accuracy of the automated system. The features were extracted from the images of the currency. The proposed system will work on two images, one is original image of the paper currency and other is the test image on which verification is to be performed.

- I/P data set -The initial step in our proposed system is capturing the data from pi cam and the data received from it will be further processed.
- RGB to Grey conversion - The conversion of a color image into a grayscale image is converting the RGB values (24 bit) into grayscale value (8 bit).
- Edge Detection - Includes a variety of mathematical methods that aim at identifying points in a digital image at which the image brightness changes sharply or, more formally, has discontinuities.
- Output - the original currency will be compared with the tested image and gives out the result in the form of audio .

3.1 BLOCK DIAGRAM

Open CV is used for processing the captured image. The captured image is converted into the gray scale image by using RGB to grayscale conversion. For edge detection, KNN algorithm is used to find the edges of the image. Finally, obtained texts are converted as an audio output. Earphones/Headphones can be used to receive the audio for blind people. Python language is used for coding purpose.

Fig3.1 Block Diagram

In the above figure 3.1 the currency which will be scanned from the pi camera as an input in the form of RGB data set further the dataset will be converted into Grey with the help of RGBtoGrey() function. The resulted dataset will be sent to edge detection process ,in this process we use canny edge and Sobel edge detection .Then further it will be sent to the confusion matrix whether the currency is real or fake . The result will be in the form of text and then it will be converted into audio , with the help of ear-phone the visually impaired persons will identify the real or fake currency.

3.2 SYSTEM ARCHITECTURE

In our proposed system architecture, we use hardware components for fake currency detection using pi camera with 1024 pixel, Raspberry pi 3 model B, imper wires used, and earphone is used for audio output. The camera is used for capturing an currency note image. And Raspberry pi is an ARM based credit card sized Single board computer.In this is Raspberry pi 3 model B is used to read currency note from the hand held object for the blind person. Raspberry pi is single board computer. We use imper wires to connect to ports. Earphone is used for audio output.

Fig 3.2 System Architecture

Raspberry Pi 3 has four USB ports, allowing it to keyboards, Wi-Fi dongles and USB sticks containing all our files. Audio output looks like a headphone socket allow us to connect the Pi to computer speakers. A SD card is used as the Raspberry Pi hard drive for memory purpose.

CONCLUSION

This project aims at helping the visually disabled population to identify the currency notes between real and fake. The proposed method yields expected output on the use of KNNAlgorithm. The Algorithms that are currently used on our project based on (image processing) is performed better than other algorithms as stated by our previous studies.

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