Android Based Currency Recognition System for Blind

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Abstract: **There are around 285 Million people who are visually impaired worldwide[1]. One of the greatest difficulty faced by a blind person is to know the value of the currency that he or she has. It becomes a great difficulty for them to exchange money during purchases and they may get cheated in many instances. 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.**

Keywords: **Feature extraction, matching;**

I. INTRODUCTION

Currency recognition on a mobile phone has many applications. In this paper, we mainly focus on the problem of recognition of Indian currencies on a smart phone. It is one of the important requirementsof visually impaired people. Worldwide, there are around 285 Million people estimated to be visually impaired. The differences in texture or length of currencies are not sufficient for the identification of these bills by the blind people. Moreover, bills are not as easy to distinguish by touch as coins. So, this system helps blind people to easily identify Indian currencies in different denominations.

Here,we consider the bills of Indian National Rupee as a working example. In this architecture, the client mobile system acts as the input/output device to perform this currency recognition tasks. Work that has involved in this recognition mechanism are capturing the image, processing the image using segmentation and feature extraction, matching the test results with the features of the trained images,providing the result.

The ideal currency identifier requires the bills to be placed in good lighting. It fails to recognize wrinkled and worn out bills. Detection of blurred images was a really challenging task. But in our system, we have come across this difficulty to an extend so that it is possible to recognize wrinkled and blurred images.

Applications have also been targeted for visually impaired people, Bank officials, Resort staffs, Airport staffs.

II. WORKING

(a)   Segmentation

As shown in Figure 1, the images are captured in different orientation. In terms of lighting condition, currency should be placed properly. Image segmentation is done to extract the parts of currency which are mainly used in the process of recognition[5]. We use the features such as denomination of the currency, watermark, width and height of the currency in segmentation.

(b)   Edge Detection

Edge detection is the process of identifying the edge points of the currency[2]. This is the method that we have adopted for currency detection from OpenCV library. At the edge of any object, the pixel value changes suddenly. This sudden change in pixel value is disclosed with the help of gradients of images. Gradient is derivative of image function with respect to x and y coordinates. Where the pixel value is constant the derivative is zero andwhere the pixel value changes uniformly the second derivative is zero. And for sudden

changes both the derivatives are nonzero. This technique is used in detecting the edges of objects in the images.

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TABLE I

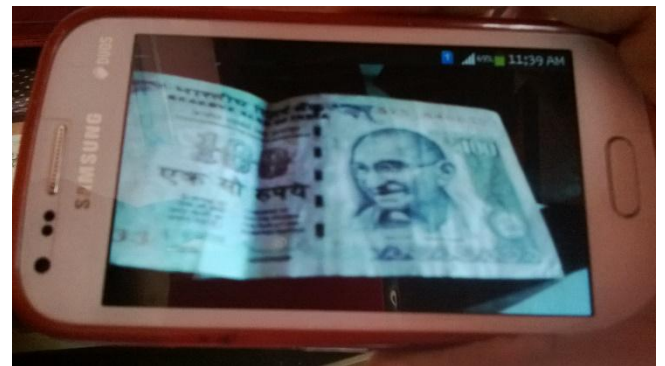|	**Blind People**	**Bank Officials**	**Resort Staffs**	**Airport Officials**
Frequency of use	Frequently used	Sometimes	Sometimes	Sometimes
Subset of product function used	Yes	Yes	Yes	Yes
Technical Expertise	No	No	No	No
User Manual/ Tutorial	Yes	Yes	Yes	Yes
Experience	No	No	No	No

Fig1: images taken for processing

III. CONCLUSIONS

We have succeeded to develop an android based currency recognition system that can be used by visually impaired people to recognize Indian currencies and its various denominations. We have implemented the system in a mobile
equipment, which is having difficulties like limited processing power and memory.For the recognition of currencies, it requires segmentation and edge detection. Through our experiments,we understood that segmentation is very much helpful for the retrieval process since it reduces the chance of reporting erroneously as well as the processing time. The methods used works on blurred

images captured using a mobile phone[3]. We expect that our system will easily adapt to other currencies of the world.

In our system, the blind people can easily identify the currencies of all denomination. They can get output through voice message.This works in a very user friendly environment. We would also provide a user manual for the users to get in touch with the system. As our future work, we would also like to implement currency converter in our system.

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REFERENCES

[1] Faiz M. Hasanuzzaman, Xiaodong Yang, and YingLi Tian, Senior Member, IEEE. Robust and Effective Component-Based Banknote Recognition for the Blind

[2] JunfangGuo, Yanyun Zhao, AnniCai Multimedia Communication and Pattern Recognition Labs, Beijing. A reliable method for paper currency recognition based on lbp

[3] KuldeepVerma, Bhupesh Kumar Singh, AnupamAgarwal Institute of technology, Nirma university.Indian Currency Recognition based on Texture Analysis

[4] Yuan Feng Department of Computer science Nanjing University,China.Extraction of serial number on Bank notes

[5] Jarrett Chambers Auckland University,Newzealand. An empirical approach for Digital currency forensics

[6] 2013 5th International conference on intelligent networking and collaborative systems Shanghai,Finance university China. A real-time template generation algorithm to identify RMB crest number