



Currency Detector Application for Visually impaired (The Blind Assist)

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Abstract: We present an application for recognizing currency bills using computer vision techniques that can run on a low-end smartphone. The application runs on the device without the need for any remote server. Visually Impaired are those people who have vision impairment or vision loss. Problems faced by visually impaired in performing daily activities are in great number.

They also face a lot of difficulties in monetary transactions. They are unable to recognize the paper currencies due to similarity of paper texture and size between different categories. This money detector app helps visually impaired patients to recognize and detect money. Using this application blind people can speak and give command to open camera of a smartphone and camera will click picture of the note and tell the user by speech how much the money note is. This Android project uses speech to text conversion to convert the command given by the blind patient. Speech Recognition is a technology that allows users to provide spoken input into the systems. This android application uses text to speech concept to read the value of note to the user and then it converts the text value into speech. This application can help visually impaired to recognize money. In this application blind people can speak and give command to open camera and camera will click the picture of note and tell the user by speech medium how much rupee note it is. By using it, anyone can easily detect fraud currency using their android mobile cell. In the country the problem is in acute situation and people want easier way to deal with it.

Keywords—Instance retrieval, currency recognition, indexing and retrieval, mobile vision

I. INTRODUCTION

Visually Impaired are those people who have vision impairment or vision loss. Problems faced by the visually impaired in performing daily activities are in great numbers. They also face a lot of difficulties in monetary transactions. They are unable to recognize the paper currencies due to similarity of paper texture and size between different categories. This currency detector app helps visually impaired patients to recognize and detect money. Using this application blind people can scan notes and tell the user by speech how much the money note is. This Android project uses speech to text conversion to convert the command given by the blind patient.

This android application uses text to speech concept to read the value of note to the user and then it converts the text value into speech. For currency detection, this application uses tensor flow model which is trained with 8000 images of currency notes so that it can judge the note with high precision. This Android project uses speech to text conversion to convert the command given by the blind patient. Speech Recognition is a technology that allows users to provide spoken input into the systems. This android application uses text to speech concept to read the value of note to the user and then it converts the text value into speech. For currency detection, this application uses Azure custom vision API using Machine learning classification technique to detect currency based on images or paper using mobile camera. . This application can help visually impaired to recognize money. In this application blind people can speak and give command to open camera and camera will click the picture of note and tell the user by speech medium how much rupee note it is. By using it, anyone can easily detect fraud currency using their android mobile cell. In the country the problem is in acute situation and people want easier way to deal with it. So to provide an android application regarding fake currency detection is a good idea. As, there are number of android mobile phone users in the country and increases per day; to provide an android application regarding fake currency detection is a good idea. Here, various development phases and the use of an application is described. Using Eclipse ADT (Android Development Tool) app is generated.

II. MATERIAL AND METHODS

Study Design: Social based Application

Study Location: Lab

Study Duration: September 2021 – April 2022

Sample size: 5-6 Currency notes for testing application

Subjects & selection method: Subject is currency detector app for blind people and selection method was to help socially visually impaired to protect them from facing frauds.

Procedure methodology:

The system is divided into two parts. The first part is to identify the currency denomination through image processing. The second part is the oral output to notify the visually impaired person about the denomination of the note that he/she is currently having. The development of this device is based on a webcam microcontroller and a speaker for sound output. The real time bank notes are captured and processed through different image processing techniques like edge detection, segmentation, and feature extraction and classification.

Here is used as a processor which processes the image of the currency note captured by the web camera. The controlling code for web camera is written and stored in processor. Captured image is stored in memory. Now process the image to identify the denomination of the currency. The processing algorithms and codes are written in JAVA Open CV. The reason for selection of the said hardware and software is that, this paper intends to make this product as a cost-efficient model using open source hardware, so that it may favour future advanced improvements from people all over the world thus benefitting the end user.

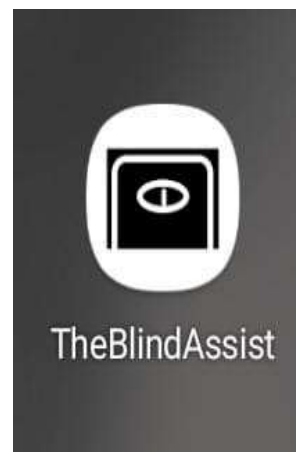
Statistical analysis:

We have a Dataset (module) which is constructed from a given collection of Indian currencies images (12,000). The Application runs in order to detect and recognize input currency images wherein user (blind person) just has to open a app which lands user on scanner screen on which user has to just scan the note and application will detect and speak out which currency note is it listening to which user (blind person) can easily identify the note and can prevent himself from any misguidance.

We have made a model using tensor flow by google and implemented it in android studio. The model is trained over 12,000 images with all possible permutations and combinations by which the user can scan the note. Android based system is created to detect the currency. For image processing and matching TensorFlow module framework is used. System is tested on android 11 (Galaxy M02S). For data set creation 8 images for each type of currency is captured. Four for front side and four for back side. Here, we capture the image through android mobile which is given as input image. We've 7 already stored multiple data of images in our dataset and from that dataset. Using SIFT and Grab Cut algorithm the image is recognized from stored dataset. After the matching process, the audio will be generated. As a result of highly trained model user can get result by using application.

Experimentation:

i) User interface designs: Home Screen and logo of application



ii) Output with explanation

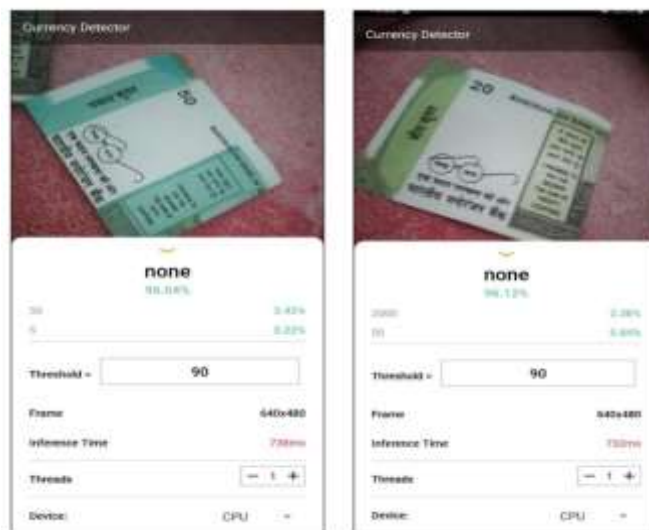
Real Currency Output

- Here, we had tested our application on my android cell (Galaxy M02S)
- These is real currency you can look out output with numbered note 1st as Rs500 and 2nd Rs50 notes with set Threshold Value i.e. 90%.
- It is detected and result in same number of note as shown in screenshots.



iii) Fake Currency Output

- Here, we had tested our application on my android cell (Galaxy M02S)
- These is fake currency you can look out output with numbered note 1st as Rs50 and 2nd Rs20 notes with set Threshold Value i.e. 90%.
- It is detected and result in none as shown in screenshots.



III.RESULT

1. This application blind people can speak and give command to open camera of a smartphone and camera will click picture of the note and tell the user by speech how much the money note is.

2. Android based currency detector for visually impaired development and use of an android application on Fake Indian Currency Recognition. By using it, anyone can easily detect fraud currency using their android mobile cell.

Table no 1:

Currency	Number of tests conducted on each currency using proposed system	Number of test succeeded using proposed system	Number of test failed using proposed system	Accuracy (%)
10	35	32	3	91
20	37	33	4	89
50	35	32	3	91
100	35	35	0	100
200	34	31	3	91
500	35	35	0	100
2000	35	33	2	94
Total	246	231	15	Accuracy % = 93.71

IV.CONCLUSION

In this project, to deal with the common aiming problem for blind users, we have proposed a mobile application for currency recognition that recognizes Indian currency to help blind persons in their daily lives. In this project, we get the output in the form of regional audio. This work will be extended as to apply the classification to compare the original or Indian currency. It is possible to add foreign languages which can be used in world wide. To develop recognition of currency notes on a low-end mobile phone for Visually Impaired persons and notify user by voice note in regional language. In future it can be extended as to recognize foreign currency. We commenced with a brief introduction to our system and discussed the scope and objectives of our project. During the literature survey. we got an opportunity to look closely into the problem that people are facing in the current environment. We have kept all the prime features of existing systems as a primary focus with some of the additional features for our proposed system.

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