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SYSTEM FOR VISUALLY IMPAIRED PEOPLE

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Abstract - *There are more than 40 million visually impaired people worldwide. Assistive technology is one of the most basic and important programs that help a person with a disability to work with his or her challenges. There are already portable operating systems that can manage the product enabling, for example, bar code readers that help to identify various products of a wide range on product sites so that blind users can access information about products through Braille and speech. But there are difficulties in finding the bar code space so pen scanners might be employed in that cases. Everything has another way to help the blind, except in currency circumstances. So, in order to overcome such a situation, we decided to use an algorithm in Python to make helpful for visually impaired people to find the type of currency and speech synthesis. In this project, we have collected all the features of the Image Processing and proposed a self assistance system for blind people, which will be able to inform a blind person about the obstacle/ object and the currency value.*

***Key Words*: *Blind Person, Currency Detection, Object Detection, Deep Learning, Neural Network, Python*.**

1. INTRODUCTION

The Indian monetary system is very important since ancient times. The Indian government introduced its first paper note of 10 rupees in 1861. The Indian Reserve bank started producing notes in 1938, and issued 2, 5, 10, 20,100 and 1000 notes. Currently the Indian currency system has various currency notes such as 5,10,20,50,100,500 and 2000 rupees. All note editions have their own printed value on the note. An image-processing approach that identifies Indian paper currencies of various denominations and identification is proposed in this work. With the development of different banking service areas, many types of automated paper currency recognition methods are very important in many systems such as automated cash machines and automatic goods seller equipment. The need for automatic note verification systems has encouraged many researchers to develop consistent and reliable systems. Where the accuracy of the recognition and processing speed of the verification system are usually two important objectives for these types of units. In such a type of currency recognition, technology focuses on searching and extracting tangible and hidden marks in Indian paper currency in order to effectively divide.

2. MOTIVATION

There are a number of people who are blind in society, who suffer while doing the basics things of daily life and that can put their lives at risk while traveling. The blind traveler relies on another guide such as the white stick, the information provided by the people and trained dogs etc. So, we are proposing a self-assistance system for blind people, which will able to convey the person about direction and type of obstacle across his path and also help them for currency and object detection.

3. OBJECTIVES

1.To assist blind people in recognizing currency and detecting obstacle/object comes in their way.

2. To learn Python to detect obstacle using OpenCV library and learn deep learning CNN algorithm.

3.To determine whether the currency is counterfeit one or the original one. The term counterfeit money is imitation of the currency produced without the legal sanction of the state government.

4. LITERATURE SURVEY

Paper[1] ***Swapnil Bhole, Aniket Dhok , "Deep Learning based Object Detection and Recognition Framework for the Visually-Impaired " IEEE Xplore Part Number:CFP20K25-ART; ISBN:978-1-7281-4889-2 ,2020.***

This paper describes object detection, classification and face and currency recognition has been presented to assist the visually impaired people. Its advantage is to recognize

a bottle, and Indian currency notes. Technology used is CNN neural network,SSD mechanism for object detection.

Paper[2] ***Kanchi Kedar ,Sai Nadh Reddy, Challa Yashwanth,SreeHarsha KVS,Pavan Anvesh Tamidala Venkata Sai, Sonia Khetarpaul "Object and Currency Detection with AudioFeedback for Visually Impaired" , 2020 IEEE Region 10 Symposium (TENSYMP).***

In this paper the object i.e bottle is identified successfully, the person around us is capable of detecting the value of the Indian currency notes. Its advantage is to recognize a bottle,and Indian currency notes. OpenCV and custom mathematical formula for image pre-processing is used.

Paper[3] ***Nili E. Krausz, Levi J. Hargrove, "Recognition of Ascending Stairs from 2D Images for Control of Powered Lower Limb Prostheses" 978-1- 4673-6389-1/15/$31.00 ©2015 IEEE 615 7th Annual International IEEE EMBS Conference on Neural Engineering Montpellier, France, 22 - 24 April, 2015 PP 615-618.***

In this paper Addition of vision for improved intent recognition control, with this work focused on determining the best method for recognizing of ascending stair edges from 2D images. It has advantage to recognize a staircase (region bounded by concave or convex lines.). convex/concave line decision system developed to produce preliminary results about the presence or absence of stairs in a given image.

Paper[4] ***Venkata Sai Teja , A Krishnamoorthy , P Boominathan, "Indian Currency Recognition And Speech Synthesis For The Visually Impaired Persons", International Journal of Pure and Applied Mathematics Volume 119 No. 15 2018, 1585-1590.***

In this paper we uses features of Rs 500/2000note to help visually impaired people in detection of fake note. It has a advantage that it is a powerful method for impaired person to detect fake notes. Processing of rs 500/2000 note through UV rays for size and color detection..

Paper[5] ***Lakshmi Narayanan , Bhavna Pancholi, " A Novel Approach to the Indian Paper Currency Recognition Using Image Processing", International Journal of Emerging Technology and Advanced Engineering.***

This paper helps to identify currency from its colour and classify into old/new and 10/20/50/100/500/2000. Able to recognize Rs.2000 note. Colour extraction of 500/2000 note.

5. PROPOSED SYSTEM

The Proposed System is combination of money recognition and object recognition and no existing system.

The proposed method is to help blind person in detecting the obstacle in front of them i.e. car, person, traffic sign etc.as a camera based assistive object detection technique. The implemented idea involves person, car and traffic sign detection from image taken by camera and produced sound after detection of object.

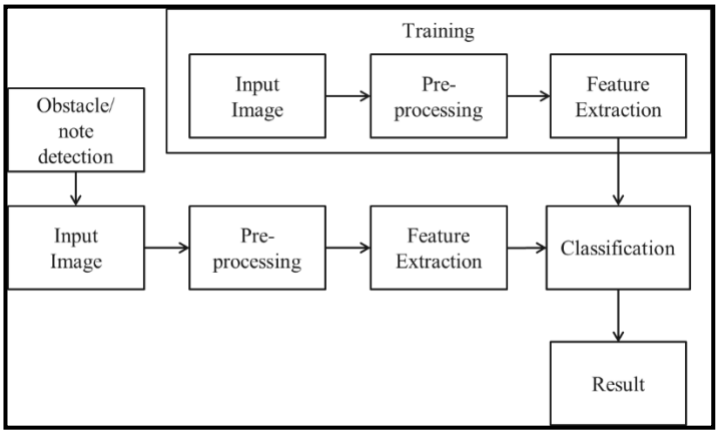

Fig-1: Architecture Of Proposed System

5.1 Input Image

Camera captures image of note or object and is feed as input to the Python for further processing.

5.2 Pre - Processing

Pre-processing of images usually involves removing the background noise of the low frequency, normalizing the density of individual particles in the images, removing the reflections and hiding parts of the images. Pre-processing is a way to enhance images data before computational processing.

5.3 Feature Extraction

Feature extraction involves reducing the number of resources required to define a large set of data. When performing complex data analysis one of the major problems come from the number of variables involved. We use Wavelet transform to extract features such as RMS value, average, image entropy.

5.4 Classification

Image classification refers to the task of extracting information classes from two or more sections of an image. Features released by wavelet conversion using ultraviolet radiation are fed into phases so that the CNN algorithm, can detect note and detect object.

Convolutional Neural Network is a class of deep learning methods that can take a image as a input, give value to the various elements in the image and distinguish one from the to others. The pre-processing time required for Convolutional Neural Network is very low compared to other classification algorithms. It is able to successfully capture local and temporal dependence on an image by using application filters.

6.RESULT

Result / output totally depends upon the clarity of the camera. In this system blind people can speak and give voice command to open camera and camera will click the picture and tell the person what object is in front of him.

Fig-2: Result

6. CONCLUSION

Blind people are people who are weak because of their eye disability. They face a number of problems in their lives, one of which is the most important to overcome is object and currency detection. Therefore we have developed a user-friendly system that can clearly identify the obstacle, object along the way and the currency using the algorithm. The result shows the configurable accuracy of the system and then the existing system. The system has several advantages such as system accuracy is very high. The complexity is very low, processing time is limited. In future we try to add staircase detection and fake note detection to make complete system.

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