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Currency Recognition App

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Abstract: Visually Impaired & foreign people 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.
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.
Keywords: Android, Speech Recognition, Azure custom vision API, Machine learning, blind patient

I. INTRODUCTION

Visual object recognition on a mobile phone has many applications. In this paper, we focus on the problem of recognition of currency bills on a low- end mobile phone. This is an immediate requirement for the visually impaired individuals. There are around 285 Million people estimated to be visually impaired worldwide, out of which 39 Million are blind and 246 Million have low vision. The differences in texture or length of currency bills are not really sufficient for identification by the visually impaired. Moreover, bills are not as easy to distinguish by touch as coins. Certain unique engravings are printed on the bills of different currencies but they tend to wear away.

We adopt an approach based on computer vision on mobile devices, and develop an application that can run on low end smartphones. We consider the bills of Indian National Rupee as a working example, but the method can be extended to a wide variety of settings. Our problem is challenging due to multiple reasons. We want all the computations to happen on the phone itself and this requires appropriate adaptation of the recognition architectures to a mobile device.

II. LITERATURE REVIEW

A. Main purpose of the system is to provide object recognition facility. There are lots of machines are available that helps the people to recognize different features of objects. But for blind people in the world have to keep a lot of different features and label for different commonly-used currencies. However, everyone has a handbook that about the features and labels of come commonly-used currencies. No one can ever be 100 percent confident about the manual recognition. So, our purpose is to detect notes with accurate results without any interference also our proposed system will save time to recognize currency by detecting notes in less time.

B. Existing systems uses optoelectronic device to produce the signal from the light refracted by the banknote. There are many currency recognition machines are available in current market through which currency can be recognize whether by using image processing technique or neural networks. Existing currency recognition systems are mainly based on processing of image using image processing techniques and neural networks. Some system uses Gaussian function in hidden layer and output layer of CNN in the place of sigmoid function. System shown that the Gaussian function is more effective than sigmoid function for the recognition of known features and rejection of unknown patterns and we are going to use machine learning to recognize notes.

C. The term Deep Learning or Deep Neural Network refers to Artificial Neural Networks (ANN) with multi layers. Over the last few decades, it has been considered to be one of the most powerful tools, and has become very popular in the literature as it is able to handle a huge amount of data. The interest in having deeper hidden layers has recently begun to surpass classical methods performance in different fields; especially in pattern recognition.

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D. One of the most popular deep neural networks is the Convolutional Neural Network (CNN). It takes this name from mathematical linear operation between matrixes called convolution. CNN have multiple layers; including convolutional layer, non-linearity layer, pooling layer and fully-connected layer. The convolutional and fully- connected layers have parameters but pooling and non-linearity layers don't have parameters.

E. The CNN has an excellent performance in machine learning problems. Especially the applications that deal with image data, such as largest image classification data set (Image Net), computer vision, and in natural language processing (NLP) and the results achieved were very amazing. In this paper we will explain and define all the elements and important issues related to CNN, and how these elements work. In addition, we will also state the parameters that effect CNN efficiency. This paper assumes that the readers have adequate knowledge about both machine learning and artificial neural network.

III. SYSTEM ARCHITECTURE

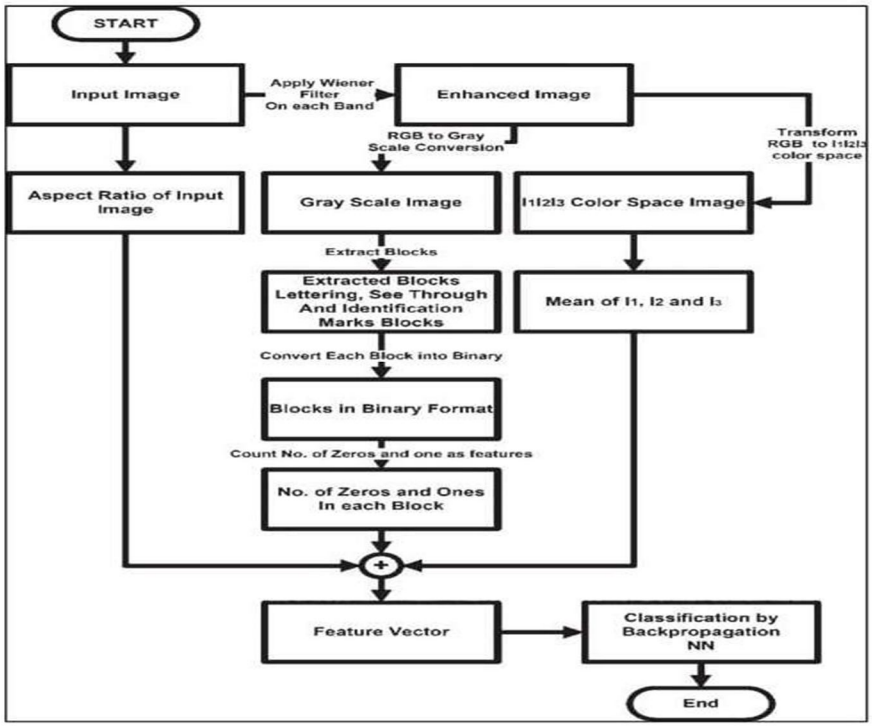


Fig. System Diagram

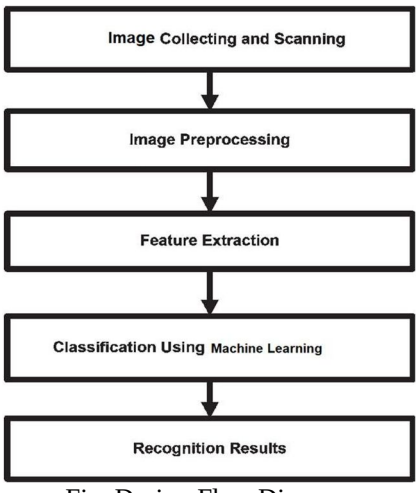


Fig. Design Flow Diagram

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IV. PROPOSED METHODOLOG

Now what blind people do is they recognize coins by the size and shape of coin but what about notes, there is no way to identify the notes because all the notes are same. 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. This App can be also useful for foreigners because they don't know anything about our Currency.

Using this application people can 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.

A. Hardware and Software Requirements

1) Android Studio
2) Firebase Database
3) Notepad++
4) Intel 3.0 GHz or higher processor
5) 1 GB RAM or above
6) 50 GB HDD Space

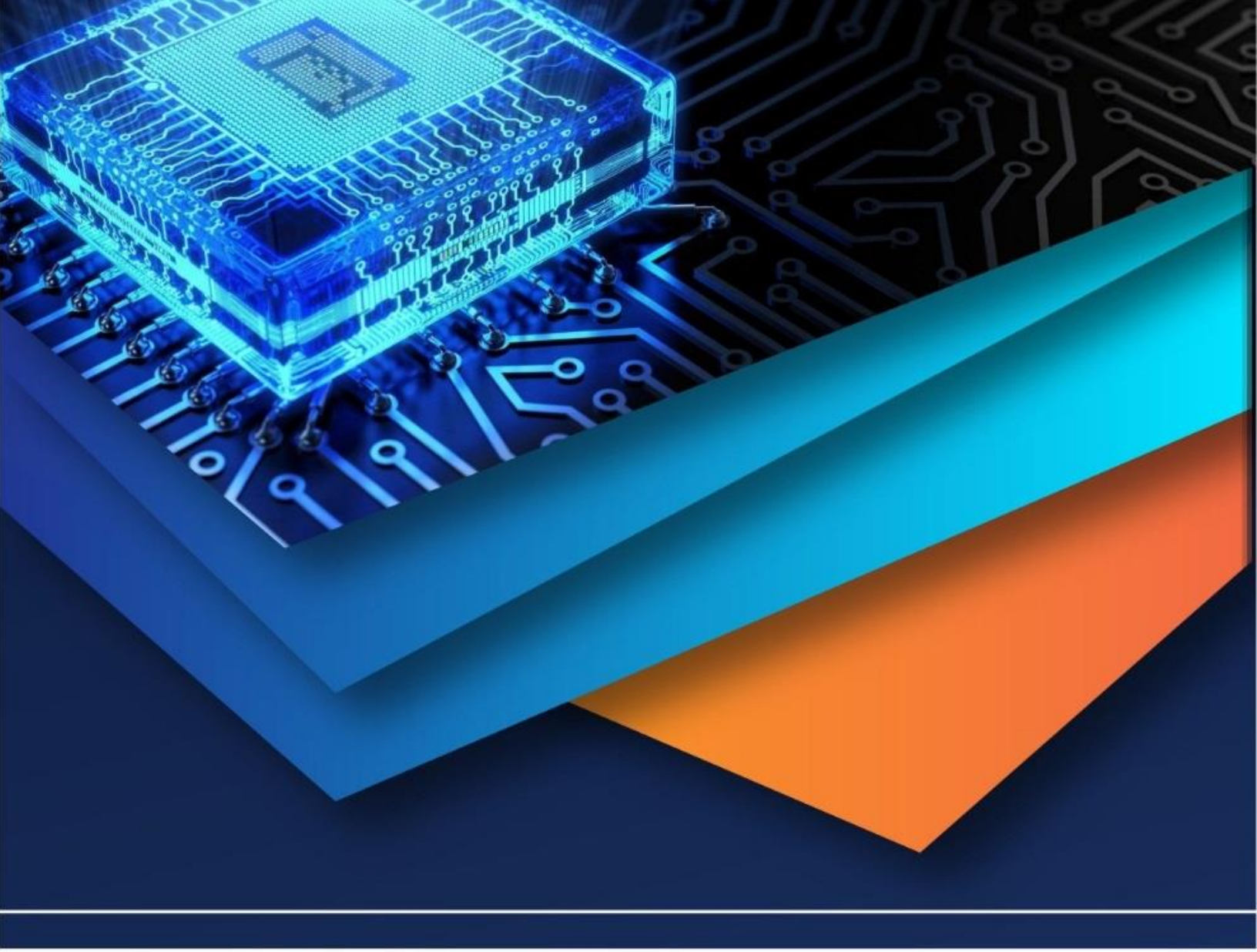
V. CONCLUSION

The development of Currency Recognition App involved many phases. The approach used is a top-down one concentrating on what first, then how and moving to successive levels of details. The first phase started with a detailed study of the problems and prospects of ordering in Foods. In the course of this study, many problems were discovered to have hindered the effectiveness of the existing manual system. These problems, information needs and activities were documented and later used as the basis for system design, which immediately followed the first phase. The design phase was concerned primarily with the specification of the system elements in manner that best met the organization's business needs. During this phase, strict adherence was made on proven software engineering principles and practices. It is hoped that effective implementation of this software product would eliminate many problems discovered during systems investigation.

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