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Blind People Summing Currency Notes

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ABSTRACT: This Android app helps blind people with money. It uses a camera and AI to identify Indian currency notes. Users can swipe to add up money, hear text read aloud, or identify a note. The application utilizes a Convolutional Neural Network (CNN) algorithm for currency identification. Upon launching the application, users are provided with instructions on how to interact with it using swipe gesture.

This app aims to make handling money easier for people who can't see.

I. INTRODUCTION

The innovative Android app is designed to enhance the autonomy and accessibility of blind people in India. Everyday tasks like managing money and reading printed materials pose significant hurdles for visually impaired individuals. This app tackles these challenges head-on by offering features like currency identification, total calculation, and text-to-speech capabilities.

Its main goal is to enable blind individuals to correctly identify Notes with precision. Employing a CNN algorithm, a powerful deep learning method known for its mediately in recognizing images, the app uses machine learning to analyse currency images taken by the phone's camera and immediate feedback to user.

This app allows blind users to easily add up different currencies. By swiping right, users can utilize a feature that identifies and total the amounts on various currency notes. This function removes the necessity for help in counting money, empowering visually impaired individuals to handle financial transactions with assurance and independence.

II. OBJECTIVES

The main goal of the app is to help blind people accurately recognize Indian currency notes. Create an Android app that aids blind individuals in identifying Indian currency notes,calculating currency totals, and changing text into speech. Allow blind individuals to easily calculate currency totals, lessening the need for manual counting. Include a text-to-speech feature for blind users to read printed materials on their own. Improve the independence and inclusion of visually impaired individuals in handling financial tasks and accessing information.

III. LITERATURE SURVEY

- The report examines the body of knowledge regarding Blind people summing currency notes. Relevant studies on the following are analyzed:-
- A Survey on Assistive Technologies for Blind and Visually Impaired People[1]
- A Review of Image Recognition Techniques for Blind and Visually Impaired Individuals[2]
- Development of a Mobile Application for Currency Recognition and Identification[3]
- A Review on Text-to-Speech Conversion Techniques for Visually Impaired Individuals[4]
- Development of a Braille Display System for Visually Impaired Individuals[5]
- Mobile Applications for Blind and Visually Impaired People: A Review[6]
- As per the global estimate, the number of people having some form or degree of vision impairment is close to approximately 2.2 billion, of which approximately 39 million people are legally Blind, and 237 million are with moderate and severe vision impairment (MSVI).1 In India alone, the population of BVIP is around 62 million [1]. BVIP rely on various assistive solutions to overcome difficulties in independent adaptability involving their professional and social activities [2]. However, the AAA factor, i.e., Availability, Affordability, and Awareness related to assistive technologies, in general, are comparatively better in developed countries [3]. One of the critical issues for BVIP (more severe in developing countries such as India) is the recognition and authentication of currency denominations. In some cases, they need to depend on the normally sighted person (NSP) for currency identification or authentication assistance.

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IV. EXISTING SYSTEM

The blind individuals rely on the assistance of others to identify and differentiate between Indian currency notes. This dependence on external support can be inconvenient, time-consuming, and may compromise the privacy and independence of visually impaired individuals. Furthermore, the existing methods for currency summation often involve manual counting, Similarly, accessing printed materials requires the use of tactile methods or the assistance of sighted individuals.

V. PROPOSED SYSTEM

The Android application proposed aims to overcome the restrictions of the current system by a comprehensive solution for blind individuals. It utilizes cutting-edge technologies like image recognition algorithms and text-to-speech conversion to empower visually impaired people and boost their self-reliance.

The application integrates a CNN algorithm to accurately identify currency notes. By utilizing the smartphone's camera, users can take pictures of currency notes, and in real-time, the application will analyze and categorize them. This feature enables blind individuals to independently recognize the denominations of Indian currency notes without needing external help.

Furthermore, the application provides currency summation functionality. Users can input multiple currency notes by swiping to the right, and the application will precisely calculate the total amount. This capability eliminates the necessity for manual counting and enables blind individuals to manage financial transactions with confidence.

In addition, the application includes a text-to-speech conversion feature. By swiping to the left, users can capture images of printed text, and the application will convert it into spoken words. This feature allows blind individual.

VI. METHODOLOGY

Requirement Gathering: To comprehend the unique requirements and difficulties faced by visually impaired people in identifying currencies, summarising information, and gaining access to printed documents, conduct in-depth research and user interviews.

System Design: Design the architecture and user interface of the application, ensuring a user friendly and intuitive experience for blind users.

CNN Algorithm Development: Train and fine-tune a CNN model using a large dataset of Indian currency notes to accurately identify different denominations.

Application Development: Implement of the CNN algorithm, currency summation, and text-to-speech conversion features.

Testing and Validation: Conduct extensive testing to ensure the accuracy and reliability of the currency identification, summation, and text-to-speech functionalities.

CNN (Convolutional Neural Networks)
Convolutional Neural Networks and conventional Neural Networks differ in their architecture. Traditional Neural Networks process an input by passing it through multiple hidden layers. Each layer consists of neurons, with each neuron connected to every neuron in the preceding layer. Ultimately, there is a final fully-connected layer known as the output layer, which showcases the predictions.

CNN Architecture
Convolutional Neural Networks have the following layers:

- Covolutional
- ReLU Layer
- Pooling
- Fully Connnected Layer

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Yolo(You Only Look Once): It is a method / way to do object detection.
Current Approach (Based on Provided Information):
Uses a CNN algorithm for currency note identification.
CNNs excel at image recognition tasks.

Potential Benefits of YOLOv5 (if implemented): YOLOv5 is known for its speed and accuracy in object detection.
It might offer faster real-time performance compared to a standard CNN implementation.
However, implementing YOLOv5 would require:

- Training a custom YOLOv5 model specifically for Indian currency notes.
- This might involve collecting a large dataset of images and potentially modifying the model architecture.

VII. TOOLS AND TECHNOLOGIES REQUIRED

The report covers the hardware and software requirements for the development of Blind people summing currency notes:

Hardware and Software Requirements

RAM	:	2 GB
Hard disk	:	100 GB
Process	:	32/64 Pentium
Software Requirements		
IDE	:	FLASK
Language	:	Python.
Tool	:	Jupyter Notebook
Software	:	Anaconda
Front End	:	HTML, CSS
Libraries	:	Tensorflow, keras, numpy,pandas
Operating System	:	Windows/Android

VIII. CONCLUSION

The Android app was created for help to blind people to find Indian currency notes, calculate currency totals, and convert text to speech. After developing and testing the app, some important findings emerged:
The system was able to accurately determine the values of Indian banknotes. This high degree of accuracy demonstrates how computer vision techniques can help those with vision impairments with everyday chores.
Visually impaired users can handle cash, do calculations, & get important information more easily.

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