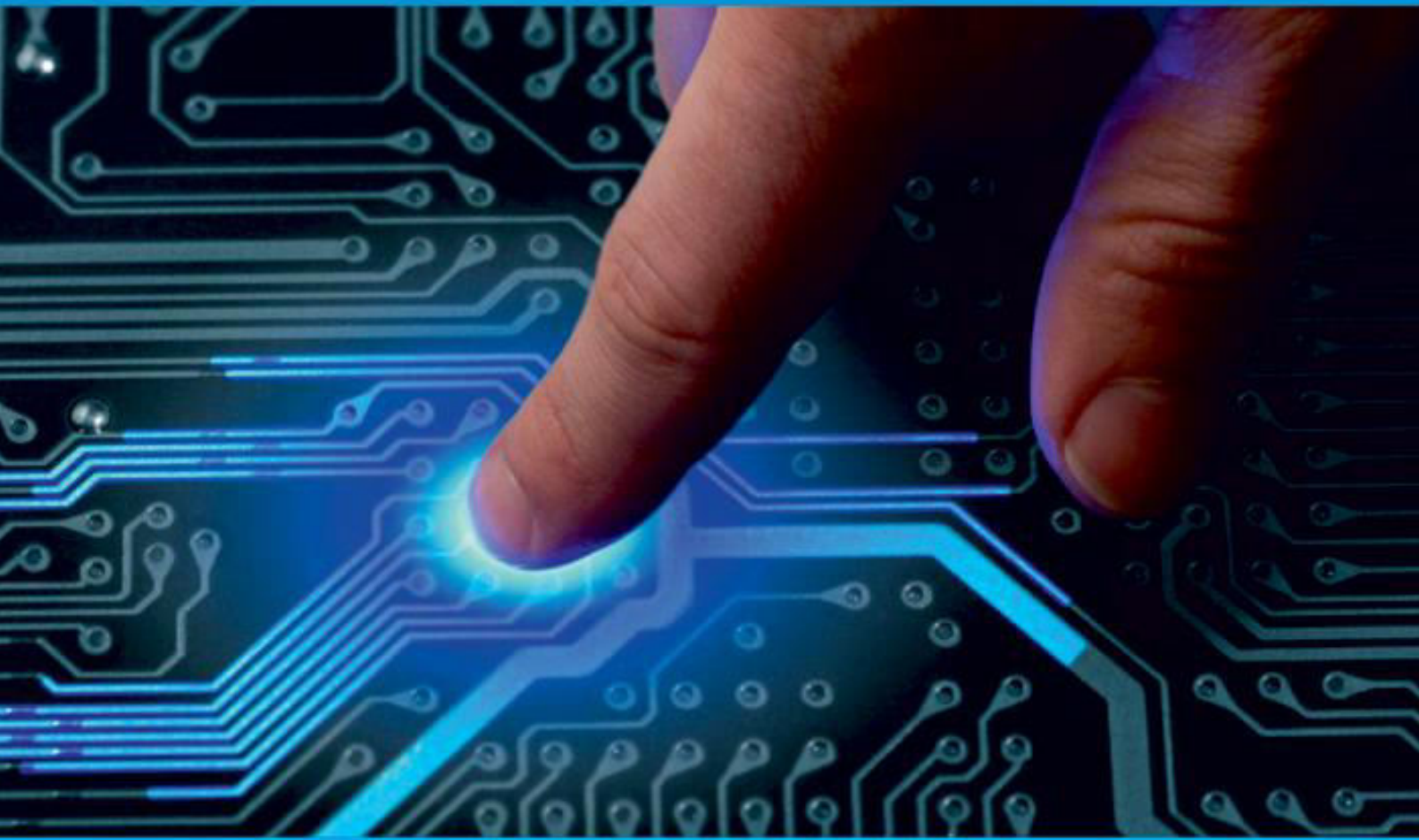




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# Naitra: A Currency Detection Application

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**ABSTRACT:** Naitra is a mobile app for visually challenged people, to help them recognize currency. This application provide features like voice output, calculating total currency and user-friendly simple UI. Naitra could help many visually impaired people, who face difficulties while recognizing and exchanging currency.

**KEYWORDS:** Currency, Object Detection, Visually Challenged People.

## I. INTRODUCTION

Naitra is a free mobile application for visually challenged people. It is designed and developed to help visually challenged people to recognize and exchange currency with ease. The application provides features like voice output calculating total currency and user-friendly simple UI. Naitra could help many dim sighted people, who face difficulties while recognizing and exchanging currency. Naitra is the solution for a major problem faced by a visually challenged people. This application is based on simple image processing utilities that ensure performing the process as fast and robust as possible. The basic techniques utilized in our proposed system include object detection based on the cross-correlation between the captured image and our data set.

## II. LITERATURE REVIEW

One of the most important problems faced by visually impaired people is money recognition, especially for paper currency. We have heard many cases regarding fraud and scandals faced by visually impaired, which is resulting into loss of trust as well as property. Therefore, in this paper we present a simple currency recognition system applied on Indian banknotes.

Currently there are some apps which may detect the currency, but they're not updated with the newest currency updates. They can only run on the high-end devices, also using the internet is compulsory for these apps so user can face difficulties while using these apps if internet isn't available in that specific area.

Therefore, we present an application for recognizing currency using computer vision techniques that can run on a low-end smartphone device. The application runs on the device without even needing a remote server or an internet permission. It is intended for robust, practical use by the visually impaired. Though we use the paper bills of Indian National Rupee as a working example, our method is generic and scalable to multiple domains.

## III. METHODOLOGY

In India, nearly 12 million visually impaired people had difficulty in identifying the currency notes. There is a need to develop an application that can recognize the currency note and provide a vocal message. Therefore, we decided to develop an application for recognizing currency. The application is developed using Flutter, an open-source UI software development kit created by Google. For this application, Google teachable machine, a web-based tool is used to create machine learning model.

The backend comprises of the tflite package using tflite model along with labels which specifies all the classes. The flutter\_tts is a text-to-speech module in flutter used to convert text to speech, used here so that the output can be obtained as an audio.

Based on the results it has been observed that the proposed model performs well and has good accuracy.

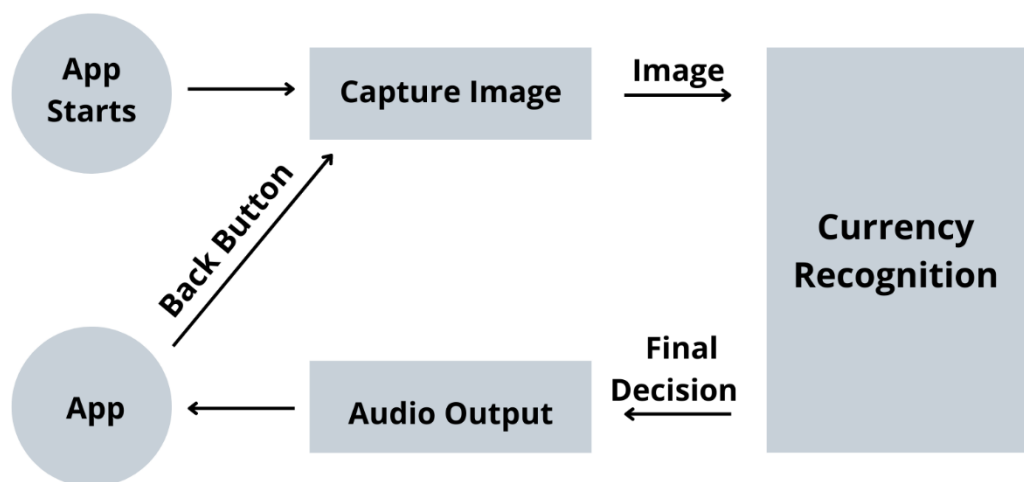
## IV. RESULT AND DISCUSSION

The purpose of this project is to not only solve visually impaired people's real-life problem but to help them to overcome their deficiency. This application can run on a low-end device without even needing a remote server or an

active internet connection. The results demonstrate that the proposed application can recognize Indian paper money with perception of 89% in short amount of time

## V. SIMULATION RESULTS

The simulation results showed the accurate respective image and text information when a picture of a currency is clicked using phone's camera. The model recognizes the currency note and gives the voice output of the class label which is matched.



## VI. CONCLUSION AND FUTURE WORK

The purpose of this mobile application is check whether the visually impaired people have been handled the right amount of money and thereby, ensuring that they have not been cheated upon, giving the output as a computer generated audio, having basic UI for better User Experience.

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