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Currency Detection Using Image Processing

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Abstract
-Counterfeit banknotes are a big problem In the world. Almost all countries are seriously affected This has become a very serious problem. Main purpose Behind this study, we now recognize Indian banknotes A hybrid approach to creating apps in a portable way Used on the go. In this study, the characteristics of Indian banknotes They are extracted, saved in a MAT file and archived. Features are combined with incoming banknotes Recognize whether it is genuine or duplicate. Easy with this system Recognize banknotes anytime, anywhere. I used MATLAB image processing toolbox. Image processing How to permanently enhance the image information of an image Machine or hardware recognition. ticket is With a local binary model Principal component analysis. LBP is an important advance It is a plot analysis and is used for matching purposes. PCA Educational purpose. Euclidean distance algorithm is used Combine metrics with simple measure calculations. Recognizing currencies presents major challenges such as watermarking Recognition, invoice resolution, dirty invoices, etc.The currency counterfeiting could be a massive drawback for the planet. nearly each country has been badly littered with this that has become a really acute drawback. the most purpose behind this study is to acknowledge Indian currency with this hybrid approach that is moveable ANd creating an application used on the go. during this study, the Indian currency note options can be extracted and can be keep in MAT files and so these keep features are going to be matched with the input currency to recognize whether or not it's real or duplicate. With this technique, easy to recognize the currency note anyplace, anytime. I even have used the MATLAB image process chest. The image process could be a way to improve the pictorial data of the image for the sake of machine or hardware perception. The currency notes are going to be recognized with the mix of each native binary patterns and principal part analysis. The LBP is important progress in texture analysis and used for matching purpose. PCA is employed for training purpose. euclidean distance algorithmic rule are going to be used for combining the metrics that has straightforward live computations. Currency recognition has massive challenges like watermark recognition, currency note resolution, dirty notes etc.

Keywords: image recognition, ancient Indian currency, local Binary pattern, Euclidean distance, principal component analysis And MATLAB

I. INTRODUCTION

Having nice technological advancements within the field of color printing, duplicity and scanning the counterfeiting drawback is one of the foremost serious issues from the past few years. In the hobby, solely the printing homes was able to build counterfeit paper money however currently of late anyone will print the counterfeit currency at house, at workplace or the other place by using the acceptable required tools like: a ADP system, a laser printer etc. thus this is often an enormous issue to tell apart the counterfeit currency from the real one by exploitation the automatic machine devices or by pc. Counterfeit currency could be a quite huge drawback of the many developing and developed countries and India is additionally affected from this problem. Authors [1] introduced an inspiration known as physicist Wavelet Grids that wont to localize region of importance (ROI) for the various categories image recognition. The pattern representation is predicated on the physicist riffle Grids. The GM

(1,1) model [2] uses as associate degree initial part of the first order accumulated X generated sequence that used as initial condition for the applying model. The model has some limitation of being inefficient for the usage of full info from the model likewise as unable to sight the points on the edges of image RMB is that the Chinese legal currency. RMB is having wholly distinctive numbers. This is the rationale that we have a tendency to decision the currency variety as a symptom of the currency. In this paper [3] identification of RMB variety technique is explained and the rule supported the genetic evolution neural network. supported the LBP rule [4], associate extended version of LBP that is referred as block LBP rule, is projected in this analysis study for the

winning of currency characteristics extraction and data. This technique has the advantages of speed and ease over the LBP rule.

The experimental result shows that the system includes a high recognition rate and therefore the strength for the illumination changes as well for the noise. during this projected analysis work, Authors [5] have described a microcontroller primarily based system to automatically establish the serial numbers of Indian paper currency. this method utilizes the assorted image process techniques additionally some algorithms. These options of Indian paper currency [6] area unit highlighted for the counterfeit detection which embrace finding and choice of the safety threads,marks and watermarks.

The feature extraction is deployed on the images of currency note then it's compared with the original currency options that ar keep within the information The Sobel operator with the gradient magnitude is employed for the extraction of the currency characteristics. during this paper [7], identification of serial variety on the RMB could be a non-linear and high dimension pattern recognition downside. it's the one in every of the serious issues within the image recognition. This work studied number of categories optimize algorithmic program within the applied mathematics learning theory that acknowledges the SMOD algorithmic program and its main motive to acknowledge the serial variety of the currency paper. It applies the SVM (support vector machines) into serial variety machine recognition of paper money.it keeps forward serial number identification theory that establishes the identification method of the identification done by SVM. The research work [8-13] shows a couple of new extraction technique for the currency recognition supported paper The Markoff process concept has been deployed to the model for the paper currencies texture as impulsive method. The planned methodology during this research paper will be useful and accustomed acknowledge actual paper currency from the various paper currencies.In the previous researches, Work has been wiped out this field regarding Feature Extraction, Feature Matching, and etc. Most of the papers they arranged stress on the extracted variety feature of the note and a substantial technique is being employed to visualize for counterfeit. during this paper a GUI based mostly application, the method begins from image acquisition and ends with the matching. additionally, to extend the matching there is a usage of Principal element Analysis, native Binary Patterns and euclidian Distance has conjointly been used on the note with a info of fifty samples.

II. METHODOLOGY

Methodology The system proposed here works on the image of a banknote in ultraviolet light acquired by a digital camera. The algorithm applied here is the following:

1. Acquisition of an image of a banknote in ultraviolet light using a simple digital camera or scanner.
2. The scanned image is an RGB image and is now converted to a grayscale image.
3. Edge detection of the entire grayscale image.
4. Now the characteristic features of paper money will be detected.
5. The intensity of each characteristic is calculated.
6. If the condition is satisfied, the banknote is said to be original if not false.This method uses the characteristics of currencies that ordinary people use to differentiate between different denomination notes.

1. Flutter, photocamera, modulo di svolazzante vocal sintesi: --- Flutter is Google's Open-Source Framework for creating veloci app, productive and flexible. Use Flutter, you can create a mobile application using the widget. In addition, the best benefits of Flutter include Hot Reload and Hot Restart which are not abbiamo while building the mobile app with Java or Kotlin using Android Studio. Nell'application Flutter, se devi insert plugin o dependenze, devimenzionarlo in puspec.yaml. Nice creation of this application abbiamoutilizzatomolti moduli o plugin cheincludono modulo fotocamera, modulo tflite, modulo flutter_tts, ecc.

The camera module is a Flutter plugin on Android that allows access to the entire webcam. Vieneutilizzato per visualizzare the live telecamera anteprima in a widget, video recording and several other features. The dipendenze del modulo dellafotocameradevonoessere menzionato in pubspec.yaml in flutter. Utilizziamoquesto modulo in modoasincrono in cui alcune funzionivengonoeseguite in background.The Flutter Text to Speech or flutter_tts module uses a new Flutter application to convert and test in speech. Questa Camera it modulo vieneutilizzato per acquisirel'immaginedellavaluta e passarla al modello di classificazione per l'ulterioreprocesso. Dopoilcompletamento del riconoscimento, l'importo del tagliovienevisualizzato sotto form di testo e viene converted into voce utilizzandoquesto modulo flutter_tts.

2. TensorFlowTensorFlow is an open source freedom that builds on software and adds ML models. Varieoperazionicoinvoltenelmodello di rete

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neural convoluzionale like the operazione di convoluzione, illivelloReLU, il pooling, l'appiattimentopossonoesserefacilmenteeseguiteutilizzandoTensorFlow. For this you need to use various lite versions of TensorFlow.

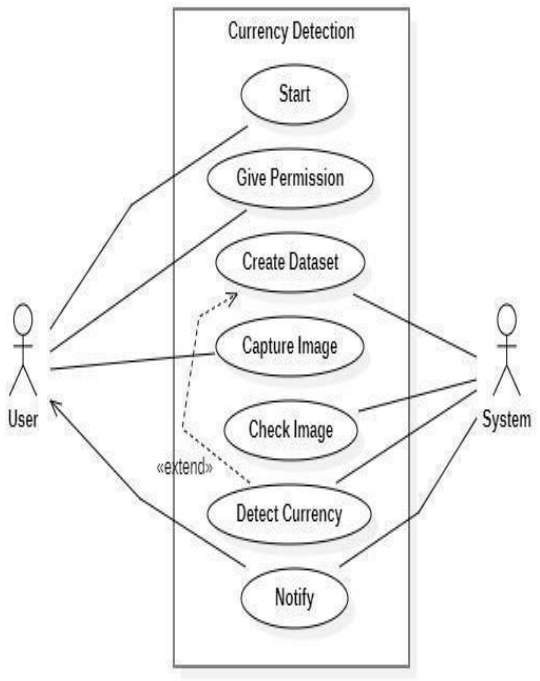
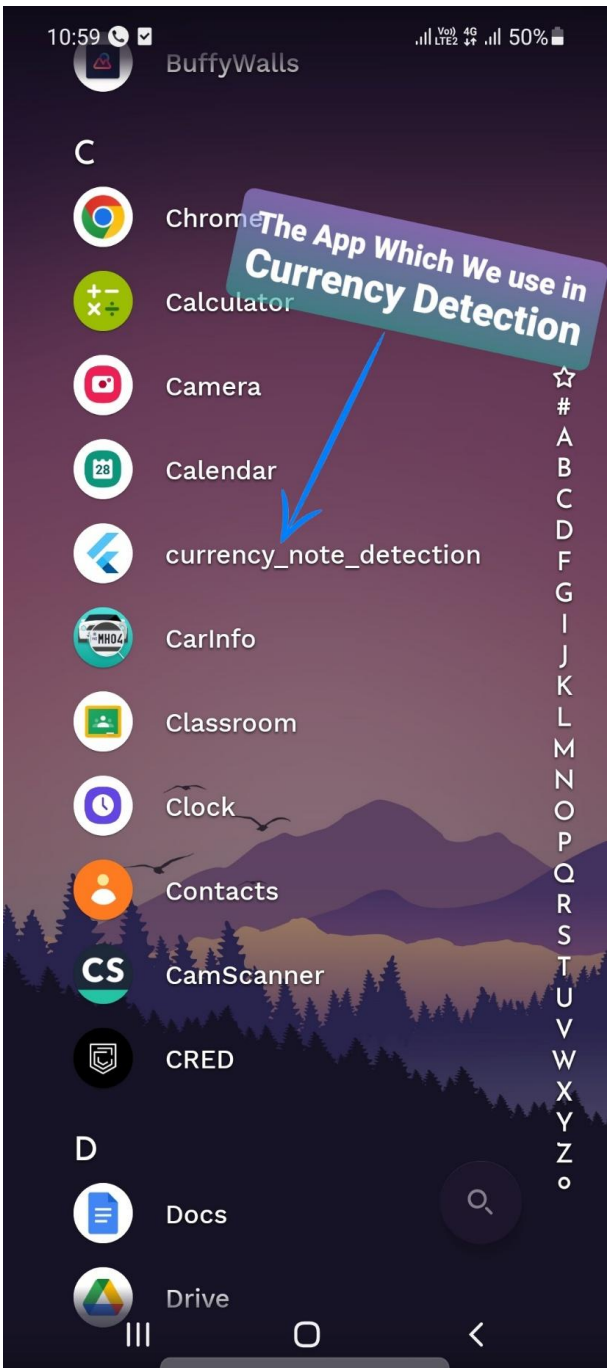


Fig 1: Work flow of the Proposed system

App Symbol



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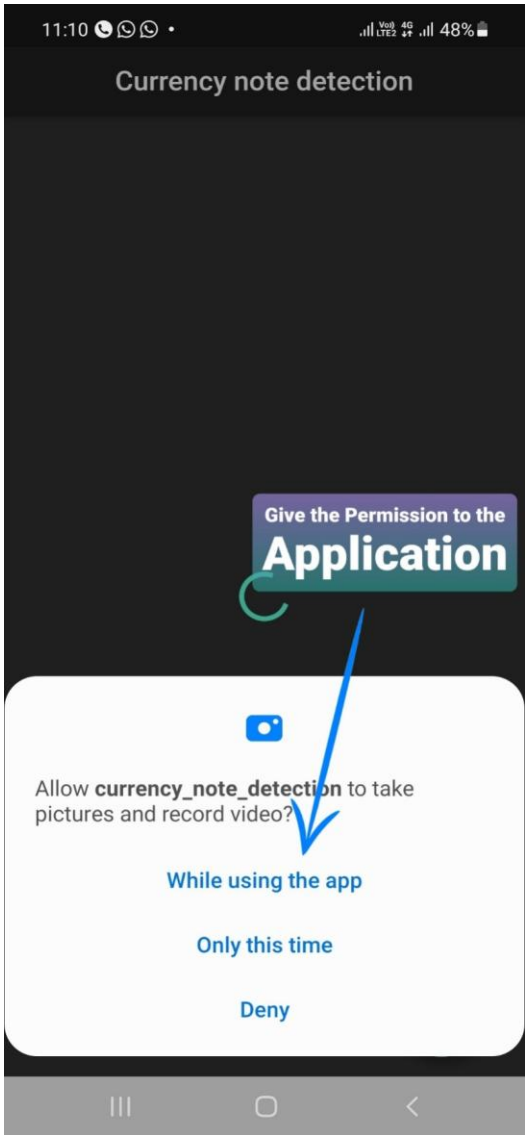
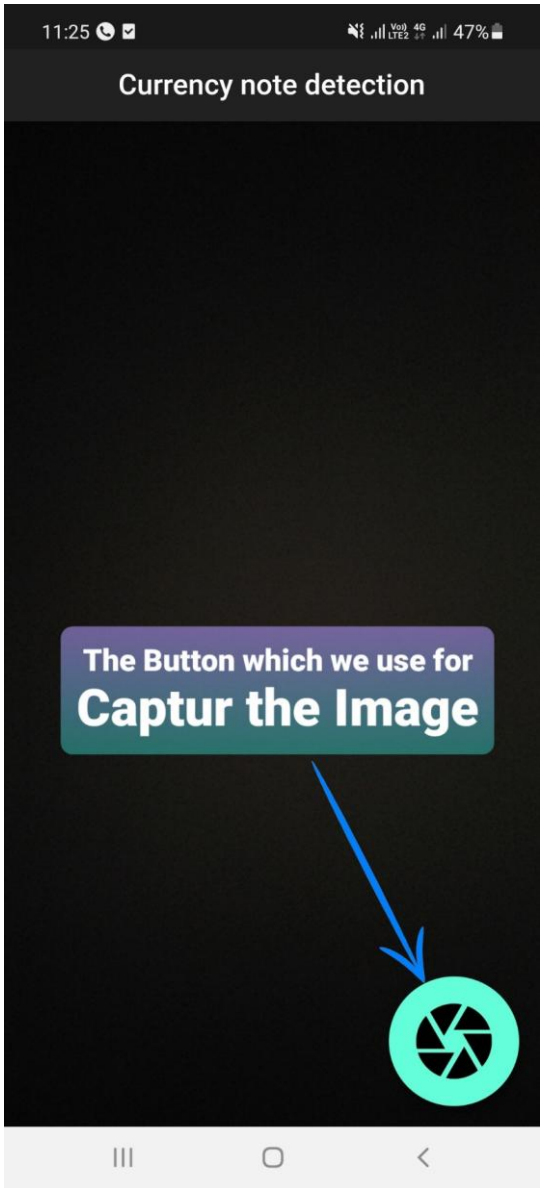
Asking for Permission

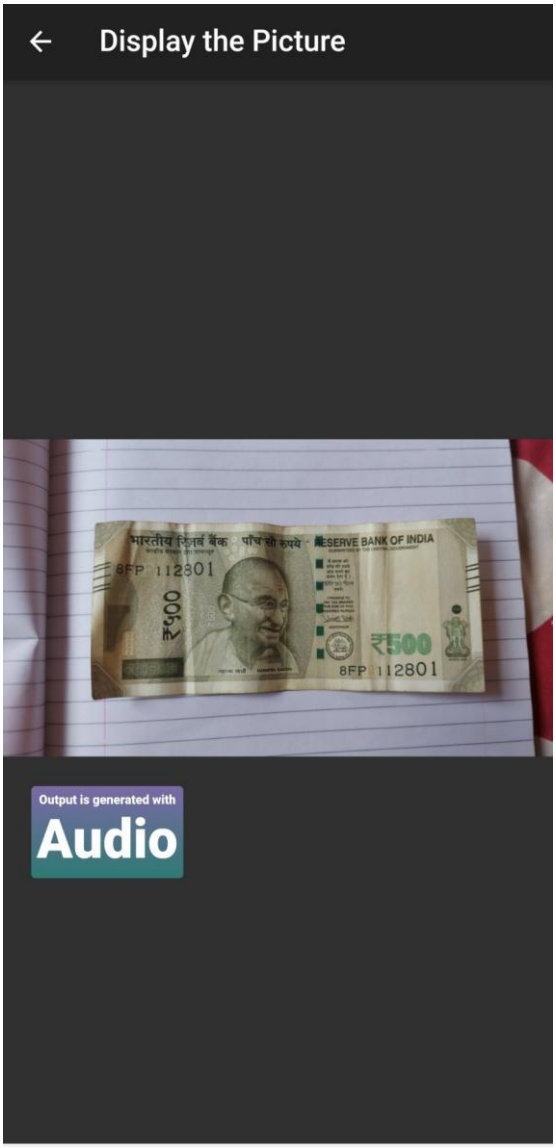


Starting of App



Capture the image from your real camera

Output in the form of audio



III. CONCLUSION AND FUTURE

Despite an intense research in the field of currency recognition, there are many issues related to its which are still untouched I worked on the all kinds of Indian currency notes (5, 10, 20, 50, 100, 500 and 1000) and extract the 6 features of currency for the recognition purpose. Matching them comes to certain conditional matching presently,

1. The note should be of high resolution.

2. The size of currency images should be same.

3. Image enhancement with change in the features.

In this paper, the hybrid algorithm based on PCA and LBP techniques here which basically increase the recognition accuracy by giving the 100% correct recognition. The base de donnéesd'imagesdoitêtresuffisammentgrande., should contain the samples of different forms of currency including the clean notes, dirty notes, torn notes. So that an increase in the accuracy.

Future work

When I take it un'immagine di input dall'esternoil record di formation non è quindiaccurato al 100%. Possiamorisolverequestoproblemamigliorandosyste m.Ilsistema non riconosce la funzionenascostacommel'immaginelatente e la filigranadellavalutacartacea.

Quindipossiamoanchemigliorareilsistemaaggiungen doquestefunzionalità al sistemaproposto. Il riconoscimentopuòesserefatto per glialtridiversipaesi reed. Possibilità di aggiungere le immagini di valutachehannoildiversoangoli come, davanti, dietro, davanti in sensoorario, davanti in sensoantiorario, indietro in sensoorario, indietro in sensoantiorario per migliorareilriconoscimento process. Capacità di implementarevalore application mobilibasatasulriconoscimento per gliutenti in modoche a increase the availability and tornare a portata di mano, oltre al punti sui mensionati, le funzionalitàaggiunte, ad esempiol'interface GUI and portability. Se puòpritere in consideration anche la rete neural sioccupadella formation delleimmagini. Neural artificialearroccato The classification basatasulla rete è unadellepiù frequent use method.

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