

Design and Implementation Android Application for Recognition of Fake Indian Currency

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ABSTRACT

In recent days, smartphones are key device for everyone with the progress of the advancement android Smartphone's are outfitted with additional application can help ostensibly tried society. These ostensibly tried have a less impression of their general environment and they stand up to a lot of inconvenience in perceiving currency. The ostensibly tried can't perceive the hurt currency notes and the Indian currency notes have a size complexity of just ten mm between two consecutive denominations and make it significantly impossible for an outwardly debilitated individual to choose it precisely. As a bit of currency affirmation structure for ostensibly tried, a successfully made strategies are Gaussian mix illustrate, Texture based affirmation and Neural frameworks. The structure to propose the technique for extracting the denomination of Indian currency note which can be used the control count that limits currency notes and shading planning framework used to perceived the currency note. The affirmation system is made the part is pre-processing, including recognizing edges, pressing data dimensionalities, and extracting features. This technique can be used further in seeing the currency notes with the help of feature extraction. The change of more Informative descriptors and furthermore the use of neighbourhood restrictions using computations and extracting the equipped for being heard message from the descriptor feature estimations of the photo data which will be advantage for the outwardly debilitated people.

Keywords : Fake Currency, Currency Circulation, Counterfeit Detection.

I. INTRODUCTION

The Reserve Bank is the one which has the sole right to issue bank notes in India. Reserve Bank, as other national banks the world over, changes the diagram of bank noticed now and again. Usually, threatening to counterfeiting measures included joining fine detail with raised intaglio engraving on charges which grants non-experts to easily spot impersonations.

On coins, handled or set apart with parallel scores edges are used to show that none of the huge metal

has been scratched off. Reserve bank uses a couple of strategies to recognize fake currency.

This counterfeiting is so outstanding to such a degree, to the point that it is considered as second world bringing in earlier days. Coinage of trade began the Greek city of Lydia around 600 B.C. Before the introduction of paper money, the most dominating technique for counterfeiting included mixing base metals with unadulterated gold or silver. A run of the mill rehearse was to "shave" the edges of a coin. This is known as "Removed". Reliably, an expansive number of "fake" notes are disregarded retail counters and the larger part are not perceived as

counterfeit until the point when the moment that they're assessed by the bank. Routinely, retail relates don't know how to perceive true blue money or they rely upon the most direct of all threatening to counterfeiting devices; the counterfeit pen. Shockingly, contingent upon the pen alone wouldn't get anyone other than a fledgling who is printing money on a laser printer.

The standard effect of counterfeit on economy is extension. The principle game plan that is specifically available for fundamental man to perceive counterfeit currency is Fake Note Detector Machine. This machine is by and large available just in banks which isn't reachable each time by ordinary national. Subsequently if any inhabitant is getting deceived with a fake bank note by a vegetable vendor in the midst of the market then it isn't so feasible for the subject to take that note to the bank, check the note and come back to the dealer. Each one of these circumstances require a kind of respond in due order regarding customary natives to judge a made bank note and to dodge our currency losing its regard.

Manual testing of all notes in trades is uncommonly repetitive and tumultuous process and moreover there is a dose of tearing while in the meantime giving notes. Thus Automatic procedures for bank note affirmation are required in various applications, for instance, customized offering stock and confection machines. Extracting sufficient cash related properties from the currency picture is essential for accuracy and quality of the mechanized structure. This is a trying issue to system fashioners. Reliably RBI (Reserve bank of India) face the counterfeit currency notes or wrecked notes. Treatment of broad volume of counterfeit notes powers additional issues. Thusly, including machines (unreservedly or as help to the human experts) makes notes affirmation process less intricate and gainful.

Our adaptable application absolutely centers on these necessities. As our application will be open on PDAs it would be less requesting for individual to test the designed bank notes. It empowers us to effortlessly check the currency notes immediately itself. This application uses methodologies for detection of watermark, security string, currency number plan, and straightforward enroll and unmistakable

verification check. The customer of our application does not require knowing any of the internal working of this application. The customer will get a straight forward result for the required note by following couple of direct advances. Here a solid note affirmation application using an Android application is attempted. This can use as affirmation of banknotes for apparently weakened and it is uncommonly simple to use in nature.

II. COMMONLY USED METHODS TO DETECT FAKE NOTES

A. See Through Register

The little botanical outline printed both on the front (empty) and back (topped off) of the note amidst the vertical band by the Watermark has an exact consecutive enrollments. The plan will show up as botanical outline when seen against the light.

B. Water Marking

The Mahatma Gandhi Series of banknotes contain the Mahatma Gandhi watermark with a light and shade impact and multi-directional lines in the watermark window.

C. Optically Variable Ink

This is another feature incorporated into the Rs.2000 and Rs.500 notes with re-examined shading plan presented in November 2016. The numeral 2000 and 500 on the front of Rs.2000 and Rs.500 notes separately is imprinted in optically factor ink viz., a shading moving ink. The shade of the numeral 1000/500 seems green when the note is held level however would change to blue when the note is held at an edge.

D. Fluorescence

Number boards of the notes are imprinted in fluorescent ink. The notes additionally have optical filaments. Both can be seen when the notes are presented to ultra-violet light.

E. Security Thread

The Rs.500 and Rs.100 notes have a security string with comparative noticeable features and engraving "Bharat" (in Hindi), and "RBI". At the point when held against the light, the security string on Rs.2000, Rs.500 and Rs.100 can be viewed as one persistent line. The Rs.5, Rs.10, Rs.20 and Rs.50 notes contain a discernable, completely inserted windowed security string with the engraving "Bharat" (in Hindi), and "RBI". The security string appears to one side of the Mahatma's picture.

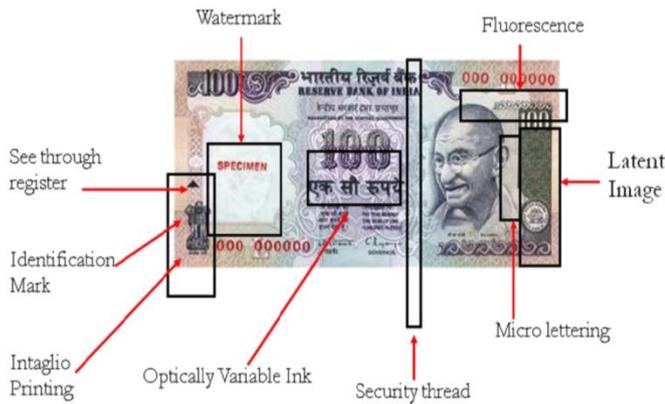


Fig. 1 Security Features of Indian Currency Notes

F. Intaglio Printing

The picture of Mahatma Gandhi, the Reserve Bank seal, certification and guarantee provision, Ashoka Pillar Emblem on the left, RBI Governor's mark are imprinted in intaglio i.e. in raised prints, which can be felt by touch, in Rs.20, Rs.50, Rs.100, Rs.500 and Rs.2000 notes.

G. Latent Image

On the front side of Rs.1000, Rs.500, Rs.100, Rs.50 and Rs.20 takes note of, a vertical band on the correct side of the Mahatma Gandhi's representation contains an idle picture demonstrating the separate denominational incentive in numeral. The inert picture is noticeable just when the note is held on a level plane at eye level.

H. Micro Lettering

This feature shows up between the vertical band and Mahatma Gandhi representation. It generally contains "RBI" in Rs.5 and Rs.10. The notes of Rs.20 or more additionally contain the denominational estimation of the notes in miniaturized scale letters.

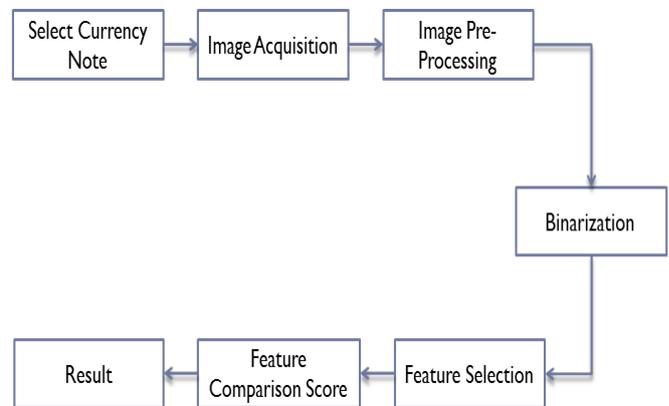
This feature can be seen well under an amplifying glass.

I. Identification Mark

Each note has a special sign of it. An exceptional feature in intaglio has been presented on the left of the watermark window. This feature is in various shapes for different denominations (100-Triangle, Rs.500-Circle, and Rs.2000-Diamond) and causes the outwardly hindered to recognize the denomination.

III. PROPOSED APPROACH

The below diagram shows step-by-step process of this paper currency verification system



A. Image Acquisition

Picture can be obtained with the assistance of camera or scanner (as android cell phone can have checking application). Picture ought to be obtained in a way that it ought to hold every one of the features.

B. Image Pre-Processing

These activities are required before the primary information examination and data extraction. Stage incorporate the concealment of undesired twists or improve some picture features.

C. Gray Scale Conversion/Binarization

Procured picture is in RGB (Red, Green and Blue) shading. Application changes over it into Gray scale since it conveys just the force data which is anything but difficult to process as opposed to preparing RGB segments. [3] Application utilizes propelled bitmap

picture handling system for this supposed binarization.

D. Edge Detection

On account of bank note detection, edge detection is imperative. Different areas of a note are utilized to coordinate with particular segments of a perfect currency to recognize suspicious reality. A normal detection is done by application which go for recognizing focuses in an advanced picture at which the picture shine changes forcefully or, all the more formally, has discontinuities. [1]

E. Image Segmentation

At this stage, picture is sectioned into its constituent areas or items. Application contains predefined code to play out the activity. Division calculation for monochrome pictures is for the most part in view of one of the two essential properties of picture force esteems

1. Intermittence.
2. Closeness.

Application utilizes abnormal state programming that decides edges in the Gray scale checked bank note and settles segments in the picture [4].

F. Feature Extraction

Feature extraction is the extraordinary type of dimensionality lessening. Application watches the visual substance of pictures for ordering and recovery. At the point when the information to a calculation is too huge to ever be handled at that point to recognize misrepresentation, it is to be seen in areas to show signs of improvement result. For this stage, application utilizes every one of the information from Gray-scale conversion, edge detection, division. Feature extraction includes streamlining the measure of assets required to portray the expansive arrangement of information. It settle space particular traits that incorporates features given in First Line Inspection Method [5].

Characteristics are arranged into:

1. General characteristics incorporates shading, surface, and shape.
2. Worldwide characteristics incorporate minute invariant, viewpoint proportion and circularity.

3. Nearby qualities incorporate limit sections.

G. Comparison

At long last, application gives the outcome where all the removed features are utilized to coordinate with unique currency note. On the off chance that it matches, application gives result as unique generally gives result as fake.

IV. CONCLUSIONS

The fundamental inspiration driving the development of this application is to give a superior method to individuals to recognize extortion in currency notes utilizing an effortlessly accessible gadget. When we utilized application, it is conceivable to recognize such extortion and the method to utilize application is easier than some other strategy. We utilized customer – server application system, the issue emerges because of the improvement in the printing of fake note isn't a major issue, as ordinary all the more examining outcomes are directed on server and those are put away for the further correlation with next arriving tests from customers.

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