

An Android Application for Recognition of Fake Indian Currency

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ABSTRACT

In recent trends, cell phones are fundamental gadget for everybody with the headway of the innovation android Smartphone's are furnished with extra application can help outwardly tested people groups. These outwardly tested have a less impression of their general surroundings and they confront a great deal of trouble in recognizing currency. The outwardly tested can't recognize the harmed currency notes and the Indian currency notes have a size contrast of only ten mm between two sequential denominations and make it profoundly improbable for a visually impaired individual to decide it accurately. As a piece of currency acknowledgment framework for outwardly tested, an effectively created methods are Gaussian blend demonstrate, Texture based acknowledgment and Neural systems. The framework to propose the strategy for extracting the denomination of Indian currency note which can be utilized the confinement calculation that restricts currency notes and shading coordinating system used to recognized the currency note. The acknowledgment framework is created the part is preprocessing, including identifying edges, packing information dimensionalities, and extracting features. This strategy can be utilized further in perceiving the currency notes with the assistance of feature extraction. The improvement of more Informative descriptors and also the utilization of neighborhood limitations utilizing calculations and extracting the capable of being heard message from the descriptor feature estimations of the picture information which will be advantage for the visually impaired individuals.

Keywords: Fake Currency, Currency Circulation, Counterfeit Detection.

I. INTRODUCTION

The Reserve Bank is special authority which has the sole expert to issue bank notes in India. Reserve Bank, as other national banks the world over, changes the outline of bank notes every once in a while. Customarily, hostile to counterfeiting measures included incorporating fine detail with raised intaglio imprinting on charges which permits non-specialists to effortlessly spot imitations.

On coins, processed or set apart with parallel scores edges are utilized to demonstrate that none of the significant metal has been scratched off. Reserve bank utilizes a few methods to distinguish fake currency.

This counterfeiting is so well known to such an extent that it is considered as second world calling in prior days. Coinage of cash started in the Greek city of Lydia around 600 B.C. Prior to the presentation of paper cash, the most predominant strategy for

counterfeiting included blending base metals with unadulterated gold or silver. A typical practice was to "shave" the edges of a coin. This is known as "Cut-out". Consistently, a large number of "fake" notes are ignored retail counters and the greater part are not recognized as counterfeit until the point when they're inspected by the bank. Regularly, retail relates don't know how to recognize honest to goodness cash or they depend on the most straightforward of all hostile to counterfeiting apparatuses; the counterfeit pen. Shockingly, depending on the pen alone wouldn't get anybody other than a novice who is printing cash on a laser printer.

The standard impact of counterfeit on economy is expansion. The main arrangement that is directly accessible for basic man to recognize counterfeit currency is Fake Note Detector Machine. This machine is generally accessible just in banks which isn't reachable each time by normal national. Consequently if any resident is getting tricked with a fake bank note by a vegetable merchant amidst the market then it isn't so attainable for the subject to take that note to the bank, check the note and return to the seller. Every one of these situations require a sort of answer for ordinary citizens to judge a manufactured bank note and to avoid our currency losing its esteem.

Manual testing of all notes in exchanges is exceptionally tedious and chaotic process and furthermore there is a shot of tearing while at the same time giving notes. Hence Automatic strategies for bank note acknowledgment are required in numerous applications, for example, programmed offering merchandise and candy machines. Extracting adequate money related attributes from the currency picture is basic for precision and strength of the computerized framework. This is a testing issue to framework fashioners. Consistently RBI (Reserve bank of India) confront the counterfeit currency notes or obliterated notes. Treatment of

expansive volume of counterfeit notes forces extra issues. Along these lines, including machines (freely or as help to the human specialists) makes notes acknowledgment process less complex and productive.

Our versatile application precisely focuses on these necessities. As our application will be accessible on cell phones it would be less demanding for individual to test the fashioned bank notes. It enables us to easily check the currency notes without even a second's pause itself. This application utilizes strategies for detection of watermark, security string, currency number arrangement, and transparent enlist and recognizable proof check. The client of our application does not require knowing any of the inward working of this application. The client will get a straight forward outcome for the required note by following couple of straightforward advances. Here a strong note acknowledgment application utilizing an Android application is endeavoured. This can use as acknowledgment of banknotes for outwardly debilitated and it is exceptionally easy 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.

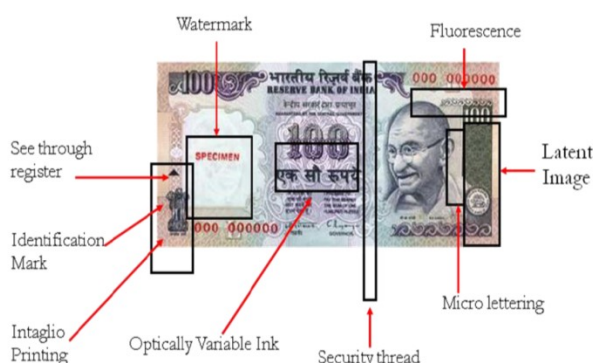


Figure 1. Security Features of Indian Currency Notes

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. IMPLEMENTATION

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

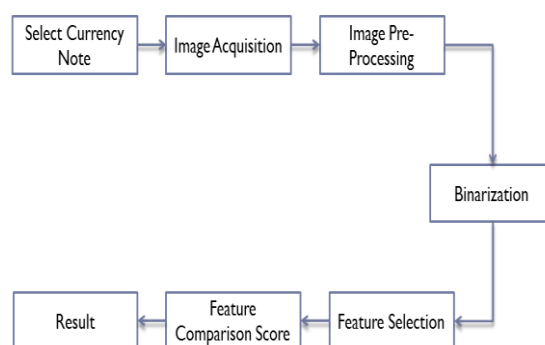


Figure 2

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

Most important motivating factor driving the development of this application is to give a better strategy than people to perceive coercion in currency notes using an easily open contraption. When we used application, it is possible to perceive such blackmail and the technique to use application is simpler than some other system. We used client – server application framework, the issue rises in light of the change in the printing of fake note isn't a noteworthy issue, as normal all the all the more

analyzing results are coordinated on server and those are secured for the further relationship with next arriving tests from clients.

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