

New Indian Currency Detection and Recognition

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Abstract—It is hard for individuals to perceive monetary forms from new Indian cash. Our point is to assist individuals with tackling this issue. Notwithstanding, money acknowledgment frameworks that depend on picture examination completely are not adequate. Our framework depends on picture handling and makes the cycle programmed and vigorous. We use and Indian Rupees as guides to delineate the strategy. Variety and shape data are utilized in our calculation.

Index Terms— currency recognition, image processing.

I. INTRODUCTION

There are more or less 50 economic requirements from one facet of the planet to the other, with each certainly considered one among them searching totally unexpected. For instance the scale of the paper is precise, equal to the range and instance. The staffs who paintings for the coins trading (as an instance the Forex market Bank) want to understand diverse forms of economic requirements and this is whatever however a simple paintings They want to remember the image of each coin. This may cause issues (for example, incorrect recognition), thus they require a skilled and meticulous framework to assist them with their paintings. As previously stated, the purpose of our framework component is to provide comfort and abilities to people who want to comprehend various forms of economics and paintings.

A "money sorting machine" may be available to assist financial institution employees understand various forms of economic. The extraordinary operating cycle of the "Money Sorting Machine" is a photo obtained and recognition. This is a technique called "Optical, Mechanical and Digital Mixed", included with calculations, recognition layout (fast photo handling), coins to fake innovations, and multidisciplinary techniques bunches. This is unique and very effective. However, for maximum staff, they want to have many attributes and enemies from Mark Fakes for a variety of economic requirements that are generally worried from their souls. Even so, each of course is considered one of them to have a manual that is about the attributes and enemies of false names from several financial structures that are less applied. Apart from that, for that, no individual can be in any variables that are around the affirmation of the aide.

In general, our system depends on taking care of the photo, the method that contains filtering, evidence that distinguishes the area, division, etc.

To make an extra comprehensive structure, we really want to make a piece of note set to get rid of the quality of money. In our structure, we were given Indian rupees as the right depiction. Its structure can be made specifically by considering python and containing clean to feel intercurrency. Transcendent progress with inside the structure are:

- 1) Read photograph, scrutinizing the photograph we get from scanner notwithstanding the relationship of the photograph is JPEG.
- 2) Pre-taking care of, disposing of upheaval, smoothening photograph.
- 3) Image process, region distinguishing proof, division, design planning.
- 4) Results printing.

Basically, the images are examined using various criteria. Regardless, we delimit our structure in order to inspect the money from the scanner. We don't need to buy another machine to understand the system because the machine that the structure requires is abnormally frequent in our everyday practice.

There are a few similar affirmation systems, such as the current affirmation structure and the exact finger influence affirmation structure.

Regardless, while the ideas they use are similar, the techniques and approaches they use are not.

II. THEORETICAL BACKGROUND

The framework depends on the scanner, PC, and calculation. The calculation manual is located in a unique figure, RGB to gray, image binarization, disposal of commotion, distribution, coordination of layout, and so on. We capture there through programming with Python®. The gadget flow diagram is defined in Figure 1, the flow diagram of the process.

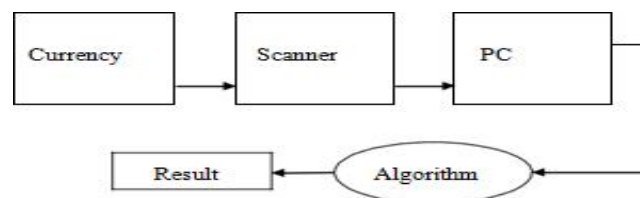


Figure 1, Flowchart of the process

The framework incorporates an entire shopper intercurrency, the customer positively needs to open the photo, and the end-product will be showed after process.

The principal piece of this structure is design organizing. In gentle of region character computation, the system plays format organizing.

At the variable while a couple of error occurs, the system will get up a couple of interesting case, which would potentially reason the exclusions like "the photo now at this point not entirely", "bombarded affirmation, etc.

A. Image Format

The photographs we acquire from the scanner are organized using the JPEG approach. JPEG (combined combined photography expert) is a standard for digital photos that is a poor compromise or disaster. When you save images as JPEG in the elements, certain information is lost, which cannot be recovered.

B. Currency Area Extraction

After our confirmation, we notice that the basic spread is still the same, with outlines on the appropriate side and the white area on the left. The water sign is situated in the white region, for positive text at the top. The coin area is strewn around in the corner, and there are a few rare coins. Models are delivered in a location that is almost uninterrupted from these types of financial principles.

There are also some extraordinary attributes to understand various financial norms. The headline is an equivalent individual, who is the previous chairman Mahatma Gandhi. Apart from that, rupees are really astounding with different individuals at each value.

Texts at the peak is in everyday language. The district value of money is spread across various diagonals. Silver string for clear and broad. In addition, friends in it are spread and restricted. These differences can be applied in our structure to help us get a more prominent explicit final product.

III. LITERATURE REVIEW

Gian Luca Marcialis et al. [1] have portrayed the usage of man or woman man or woman attestation systems with multi-separated biometrics, to fabricate the characteristic and energy towards general assortments and



Figure 2, Indian Rupees

intricate attacks. By and massive multimodal combination of biometrics changed into acted in relative on the rating-degree via way of means of becoming a member of the singular organizing rankings. Their corresponding process suggests or three drawbacks: (I) all open biometrics had been main to carry out combination, on this manner the confirmation time relies upon at the slowest layout; (ii) or three customers will be sufficient apparent the use of a sure biometric in preference to every other and (iii) the gadget intrusive nature increases. A layout depicted via way of means of the modern combination of numerous biometrics may be a primary than normal change off among call for time, execution and appropriateness. In any case, the ones designs had been deficiently examined, and no help for arranging the getting prepared chain has been surrendered till this point. In their paper, they recommend a singular consecutive game-plan and an simple mathematical version prepared to expect the characteristic of constantly combined suits as cutoff of the picked overseeing chain. Our version attracts withinside the originator in looking at the identifying the way to chain permitting a change off, unequivocally, amongst execution and identifying time. Assessments did on putting benchmark edifying facts made from currency and novel etching photographs aid the evaluation of the proposed method and multi-currency nature it and general proportionate blend.

Raghavendra et al. [2] have portrayed the Reliable customer ID which changed into a not unusual places necessity for essentially each assured shape. Biometric provide a logo call and sturdy reaction for unequivocal portions of man or woman the board via way of How to pay attention to people difficulties for their logos calling body property and directly. Multimodal biometric singular calls to turn into an excellent consistency rate began to be awaited when they defeated the unimodal male or female test. Their paper provides a unique form of testing the use of communication and flow facts. Classification of Accreditation Form Cables whose ranking has been combined with the use of complete rules after normalization. Checks have been carried out on the predetermined video facts. Important consequences show that Ace Currency finds the use of two -dimensional linear discriminatory analysis and communicates an understanding of the use of the Cepstral Coefficient Linear Prediction as a characteristic extractor and a Gaussian mixture model as a hypothesis generator with sixteen mixtures will produce half a total of 1.2 % error rate.

Uma Maheswari and Anbalagan [3] have described a careful form of multimodal biometric verification to enter real to manage, taking into account the combination of the Etsa Iris plan, currency and standing on the side. The feature vector has been made by yourself to request a photo and then re -installed and the design selected from each biometric credit score to overcome the rating of identification. Pinnacle choices that were changed to be made through a combination of their ranking degree. Their proposed form changes to be in accordance with the embedded response for excessive protection, get on an inevitable occasion about the use of biometric functions.

Mohamed Soltane et al. [15] has proposed the use of mandatory mixture capital (GMM), especially based on the maximization of total expectations (EM) assessed by an estimate for a mixture of ranking degrees. Robot biometric systems for the degree of evidence that cannot be avoided by humans, "signature" from the human body, offset the following logo calls with a statistical base, and make selection of subordinate utilities. Biometric System for Unique Testing and Seeing Confirmation of Physiological or Social Functions that are constantly firm, multi-biometric systems, which are a combination of statistics from various biometric buildups, have become normality for the reason that they are selected to win over limitations, for example, non -The satisfaction, the noisy sensor facts, massive intra-customer mixtures and deficiencies for spoof ambush which

can usually be successful about the monometric system limited to mono. An increase shows that the limited mixed capital (FMM) changed to surprise in displaying the assured and sham rating densities, combination primarily based totally the following thickness tests achieves a colossal display on INTERCURRENTY 2015 multi-biometric facts set reliant upon currency and communicate modalities.

Xiao-ning Song et al. [4] made an exhaustive assessment at the substance of the discriminant vote straightforwardly (F-LDA) evaluation and fleece cushioned assist vector machine (FSVM) classifier, exclusively. Regardless, the primary burden FSVM is that monitoring down improved importance common with the development in numerous instructions and get prepared check length. To enlighten the above stated problems, placing consistent advanced framework FSVM who joined the ability profits of FSVM and desire trees, referred to as DT-FSVM, envisioned. Additionally, withinside the extraction interplay component, a F-LDA reformative estimation is predicated upon the clean k-closest neighbor (FKNN) changed into completed to accumulate each one of the statistics scattering worldview changed into indicated via way of means of cushioned magnificence coordinated effort, that is joined to the redefinition of the gadget scatter. They made F-LDA search for the route of a unfastened general occasions withinside the portrayal of enlistment paintings serenely. Towards the end, exploiting sensitive set hypothesis, a full-scale F-LDA (CF-LDA) framework is formed via way of means of becoming a member of the reformative F-LDA (RF-LDA), inclusive of strategies for extraction near DT-FSVM classifier. There the use of crossbred hairy currency is remembered for the confirmation vote on numerous problems extensive research and NUST603 prepared at the ORL currency photo statistics base display that the proposed amplexness estimation.

Mittal, N. Likewise, Walia, E. [5] added a clever PCA via way of means of encouraging the currency of Buddhism. In their paintings, the statistics base is a sub collected via way of means of trying to find a few high-satisfactory withinside the currency. Among the precise subgroup changed into given to the PCA's call for. The potential of the proposed estimation is checked making use of a statistics base of Indian currencies, and their consequences to expose an enlargement withinside the execution of the proposed computation whilst it stands separated from the volume to the PCA approach. Had been powerful confirmation implies the use of facial nerve shape coordinated via way of means of Gabor functions. This gadget begins off evolved on convolving the currency photo with Gabor development of channel coefficients at specific scales and post. Scaling of rms (root imply rectangular) and the specific concept of the start level fuzzily slanting divert are in area beneathneath appraisal. Use mind designs to currency the statement is predicated upon the multi-side perceptron (MLP) works via way of means of inflicting the assessed go back and be a part of the reaction curl channel Gabor fly. Limit is legitimized thru a facts set search for the currency of the photo has an trade in radiant conditions. Gandhe et al. [96] have depicted a production identifying primarily based totally currency call for shape, which makes use of "form" for seeing test of appearances. The feasibility of the use of form putting in for human currency apparent proof changed into offered thru check evaluation. The ability benefit of the use of form organizing is that the development of the currency changed into solidly tended to in its depiction close by its algorithmic and computational paintings with that makes it becoming for tools use. The statistics form changed into energized with picked shape the use of pressing orchestrating estimations. The proposed estimation changed into tried BioID currency statistics base and call for price changed into regarded as one hundred percent. Their proposed method of currency statement can be carried out in undeniable confirmation systems, file manage and get admission to manage.

IV. PROPOSED METHODOLOGY

For now, the framework can definitely check the Indian rupees one hundred 500 and one hundred Yuan Indian rupees. Assuming we upload greater statistics to our information set which is a vital tone of money, a new example. This framework can be with a lot of stretching, look at what the type and coins are very valuable.

After our framework is reached, we clean up greater financial requirements for testing. To the volume of our test, all coins that are pixed from scanners can be felt. In addition, the consequences are displayed quite well. Because of a light situation and different situations, photos taken through digital automatically digital cannot be perceived too. Table II and III shows the statistical results of our tests.

Table II shows the precision with which different currencies, such as the US dollar, are classified.

We tested Indian Rupees and Indian Rupees RMB, for example. Because of the data in Table 2, the correct rate is high. That is because we not only collect a large number of photographs for testing, but they are all from the scanner. These are comparable lighting circumstances, and the images are the best. As we Notice beforehand,

TABLE II. BANKNOTE CLASSIFICATION RESULTS

	100	500	INR 100	Total
Quantity	5	5	2	12
Success	5	5	2	12
Error	0	0	0	0
Unknown	0	0	0	0
Accuracy (%)	100	100	100	100

(The full pictures obtained from scanner)

assuming we take superior photos from the camera, this fantastic acting might be changed. That is on the grounds that a certain range while in many mild circumstances is difficult. Anyway, the exact popularity of one hundred percentage is very difficult. There are several restrictions. For example, the character of the photo, the light state, the antique level of money, it is a big character for popularity.

TABLE III. DISTINGUISH BETWEEN CURRENCY AND OTHER IMAGE

	100	500	Other image
Success	5	5	5
Fail	0	0	0

(The entire images get from the scanner)

Table 3 also proven quite the right results. The device distinguishes if the photo is forex. We use five different specific pixes, which include cartoon pixes, vehicles or several words. However, this check is looking at whether the device can distinguish forex or not. Comparable to the final examination, all pixes come from scanners. The extraordinary is very excessive. Through these results, with several restrictions, the play devices are quite good. Accurate costs are quite excessive. But if you do that restriction, we cannot get excessive accurate costs like this. We are trying to adjust our rules to conquer the restrictions, it is a situation that demands us to us knowledge.

V. EXPERIMENTAL RESULTS



Figure 3: five hundred output image

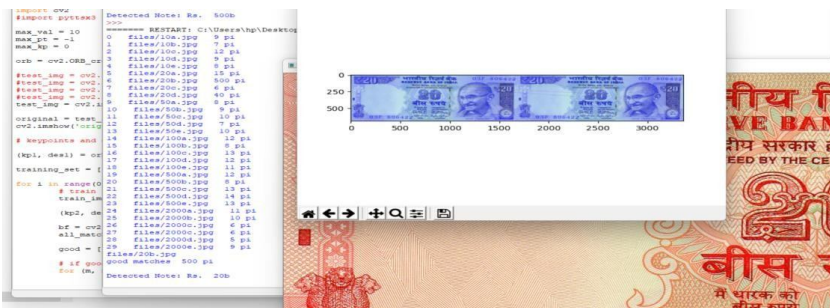


Figure 4: 200 output mages Figure

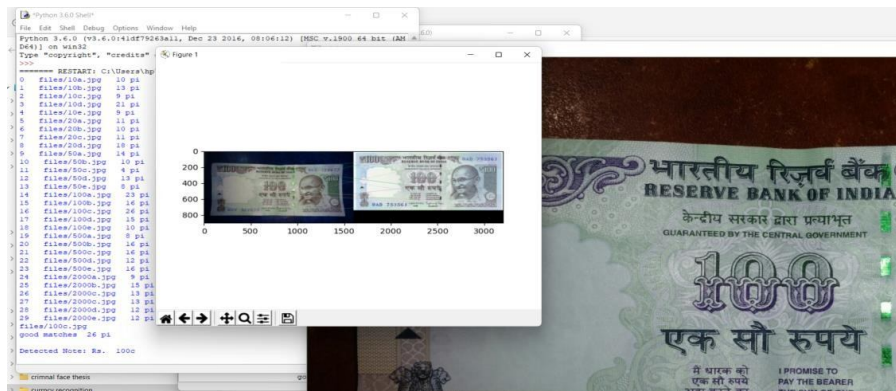


Figure 5: 100 rupees output images

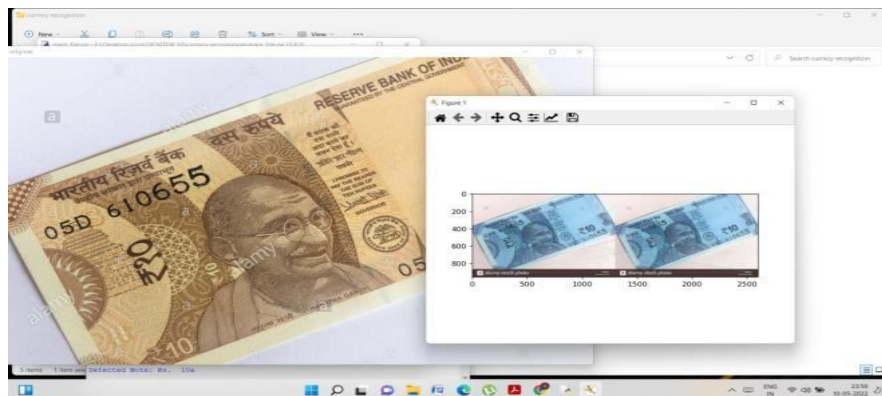


Figure 6: 10 rupees output images

VI. CONCLUSION

This the paper proposes calculations to understand cash that uses photos that deal with. The proposed calculation includes an important tone and a piece of cash for recognition. We separate the coin class that utilizes excellent advice from the beauty of R, G and B. This is the main situation to understand coins. Following, we divide the examples of coins and matching the layout is complete to really have a take a time to observe cash.

The evaluation is completed with the help of the use of applications in the light calculation mentioned shows that our cash recognition framework considers photos that deal with that can be very fast and precise.

Anyway, such a framework is like a weakness. The nature of cash checks, the level of damage to paper coins will have an impact on the level of recognition. Our framework really has several restrictions, like a mild situation.

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