CURRENCY RECOGNIZATION USING IMAGE PROCESSING

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ABSTRACT

In Everyday life Indian citizen as well as other country resident people are dealing with the problem of fake currency, currency counterfeiting. Because of fake currency there is badly effect on economy of our county. If common peoples like you or me went to bank for deposit of money and found that the currency note are not genuine in such a situations bank will not help us. This thing badly effect on our economy as well as on people who are suffering from this problem. In this system we are going to extract features of currency note. We will have previously stored features of currency then we will match the input features of currency to with the stored ones to find it to know it is genuine or not. In this we are using MATALAB tools. MATALAB tools will use for extraction of meaningful feature of currency note. In proposed system we are using image processing and machine learning algorithm. This system will useful for the common people who have to deal with paper currency in everyday life. This facility of detecting currency is available in bank but it is so costly that can't be afforded by anybody so our aim is so devolve cheaper system for people.

Keyword: - *Currency Counterfeiting, Feature Extraction, Fake Currency*

1. INTRODUCTION

As indicated by the study directed by the CIA, there are around 180+ monetary forms as of now circling on the planet. Every one of these monetary standards contrasts extraordinarily in elements like size, shading furthermore surface. Dissimilar to the former times, the exchange and business between nations has expanded in a wide range of levels. The requirement for procuring information pretty much every one of the monetary forms by the banks has been critical. Anyway for any human teller to perceive each note accurately is something not possible. In this manner the requirement for an effective mechanized framework that aides in perceiving notes is critical for what's to come.

Acquaintance Counterfeiting alludes with an unlawful duplicate of the money of beginning. Hence, fake cash isn't endorsed by the public authority. RBI is the main body capable for printing banknotes in India. Consistently, the RBI needs to manage the issue of fake banknotes once sifted and set available. At present with the improvement of better picture handling techniques, new strategies for distinguishing proof of cash is planned by breaking down explicit wellbeing data present in the money. The well being highlights are watermarks, stowed away pictures, security strings, and optically factor inks. Along these lines, to decide the money utilizing picture handling, remove the particular insights from the cash picture and select the right acknowledgment approach. The principle strategies for cash acknowledgment are by trademark mathematical size and by trademark surface. The general advances

followed by picture handling approach is to obtain picture, to distinguish edge, to convert picture to dim scale, highlight extraction, picture division and navigation. The downsides of these methodologies are recognition proficiency is less since highlight extraction is a difficult assignment. To beat this issue now the pattern is towards profound learning, since it is a multi-facet neural organization. The profound neural organization is viable for various applications progressively. a profound neural organization, we want a huge arrangement of picture information for the action to be finished. However, because of move learning method, we just need a modest quantity of informational indexes. What we do is take a model previously prepared in a huge informational index and uses our loads to remake the little informational collection we have. Along these lines, an enormous informational index isn't important and the model is likewise planned accurately. Subsequently in this paper moved learned Alex net is utilized by adjusting the last layer of this model to get the ideal precision.

The phony notes are one of the most disturbing issues occurring in genuine money trades. For country like India, it is winding up gigantic obstruction. Because of the advances in printing, analyzing advancements it is viably useful for a person to print counterfeit notes with use of latest gear gadgets. Separating counterfeit notes genuinely advances toward becoming monotonous and turbulent method therefore there is need of computerization techniques with which cash acknowledgment methodology can be gainfully done. Manual test handling of all notes in trades is exceptionally drawn-out and muddled method what's more moreover there is a shot at tearing while simultaneously giving notes. In this way Automatic methodologies for ensured note acknowledgment are needed in various applications, for instance, customized selling-merchandise and candy machines. Isolating satisfactory money related properties from the cash picture is basic for precision also force of the modernized structure. This is a major issue to structure creator. Reliably Reserve bank of India faces the phony money notes or annihilated notes. Treatment of immense volume of phony notes powers additional issues. Thusly, including machines (freely or as help to the human subject matter experts) makes notes acknowledgment process less complex and productive. Programmed machines prepared for perceiving banknotes are colossally used in programmed allocators of different things, going from cigarettes to transport tickets, similarly as in various modified monetary exercises. The necessities for programmed banknote structures asked various experts to create relating solid and solid frameworks. The technique we present here is essential, less brain perplexing and viable and can meet the quick necessity in viable applications. Plunge is a region depicted by the prerequisite for trial work to set up the legitimacy of proposed answer for the given issue. It has ended up being reasonable in various fields of exploration and in mechanical also military applications. Advanced picture planning wraps shapes whose data sources and yields are pictures and fuses shapes that concentrate attributes from pictures up to and fusing the acknowledgment of one’s things.

Various nations all over the planet utilize various sorts of monetary forms for the money related trade of certain sorts of merchandise. One normal issue looked by numerous nations connected with cash, is the consideration of phony money in the framework. India is one of the nations that deal with a great deal of issues and gigantic misfortunes because of the phony monetary standards. Because of this there are misfortunes in the general economy of the nation's currency value. The mechanical progressions have made a pathway for monetary forms to be copied to such an extent that it can't be ordinarily perceived. Progressed printers and new altering programs are utilized to make fake monetary standards. Counterfeit monetary standards can simply be slipped into heaps of authentic money which is the way they are typically circled on the lookout. Business regions like the banks, shopping centers, gems stores, and soon have colossal measure of exchanges consistently. Such spots might have the option to manage and think that it is plausible to purchase machines that utilization UV light and other strategies to recognize the validness of the cash. In any case, for average citizens it is very hard to simply recognize whether the money is phony or certifiable and they might confront misfortunes particularly during bank stores or exchanges. This framework is planned with the end goal that any individual can utilize it effectively and identify the genuineness of the cash he has by utilizing the visual highlights of the cash. This framework can additionally be changed over into an application with the goal that it is available to everyone individuals. Moreover, this framework can be intended to recognize monetary standards of different nations too.

2. LITERATURE REVIEW

Nowadays, many researchers have implemented several models to recognize currencies. But these models have several drawbacks.

In, the hybrid algorithm based on PCA and LBP techniques here which basically increase the recognition accuracy by giving the 100% correct recognition. The database of the images should be enough large i.e., should contain the samples of different forms of currency Including the clean notes, dirty notes, torn notes.

But The Problem is found that common people and economy of countries become badly affected because of currency counterfeiting .The Fake currency can't be recognize by human eyes.

In, Gesture-based recognition systems have always been a fascinating and distinct subject with the exponential growth in Computer Vision. It is a very complicated and daunting process to understand human expressions in the form of sign language.

But The Limitation of the system are, there are limitations on equipment used. Items from background or distinct features of the user may make reorganization more difficult. The distance from camera and cameras resolution and quality also causes variation in image reorganization accuracy.

In, these feature extraction techniques are powerful enough to extract features of even distorted characters/symbols. For development of the neural classifier, a back-propagation neural network with two hidden layers is used. The classifier is trained and tested for printed Hindi texts. A performance of approximately 90% correct recognition rate is achieved.

But Drawback of Optical Character Reorganization that it is not 100% accurate there are likely to be some mistake during the process. All images must be check carefully and manually corrected. This technology is costly.

In, in this paper, the authentication of Indian paper currency is described by applying image processing techniques. Basically three features are extracted including identification mark, security thread and watermark from the image of the currency.

But In this system feature extraction is done by edge based segmentation in that the segment separate into two or three regions but as we can see there are many features or identification marks on currency so with less features analysis we cannot say that the currency is genuine or not.

3. METHODOLOGY

This work Focuses on examines the recognition of currencies. The proposed methodology uses two domains machine learning and image processing. The Decision Tree Algorithm of Machine Learning and OpenCV Library for Image Processing in order to predict the result efficiently and proves to best suitable for the research work.

Admin / Authentication Module

In this module, check the authentication of user then send input data for recognition. The received input stores into the dataset. This input is use for model building. Input might be valid or invalid. If the Invalid data is given then pass the message to admin.

Dataset Upload Module

All the necessary dataset will be maintained and updated as on required as well as features Information will be maintained for further processing.

Image Processing Module

In this module, OpenCV Library is use for the Image processing.
Analysis and checking details of the currency will be carried out through this module.

Result Generation Module

In this module, the result is generated i.e. the currency is fake or not. It is one of the important modules where the currency recognition will appear.

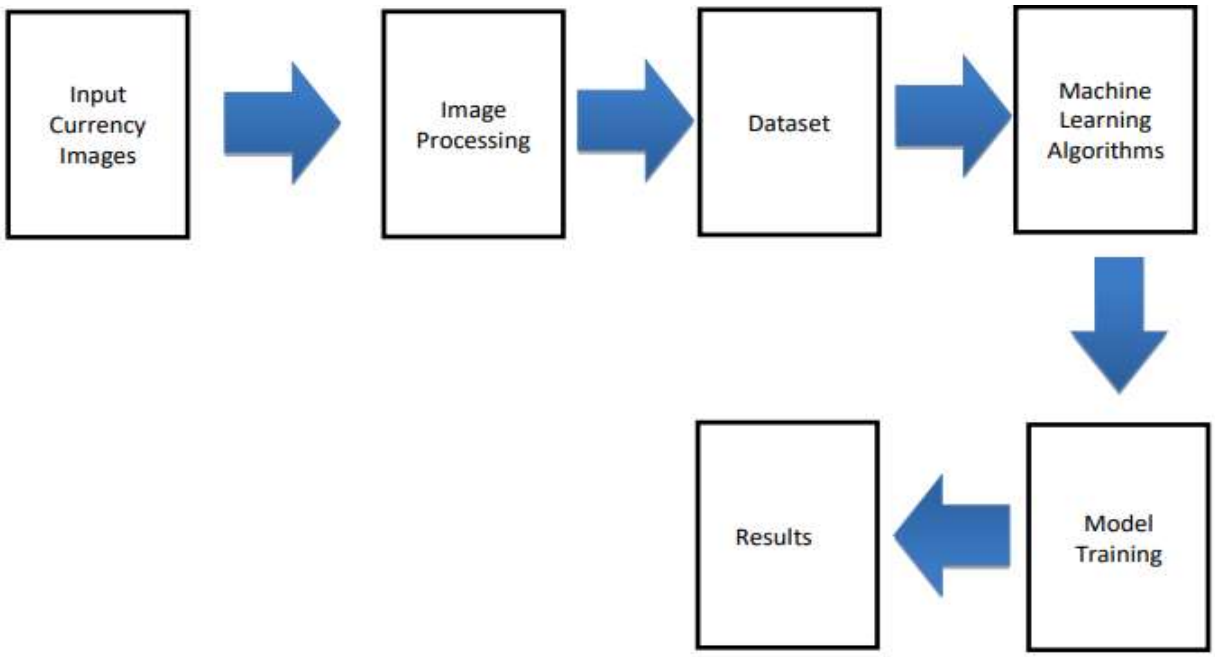

Fig -1: **System Architecture**

Input Currency Images

In Input Currency Image Block we are going to give scanned currency note to the system to verify it is genuine or not.

Image Processing

In Image Processing Block the features of input image is going extract for the extraction of image we are going to use OpenCV library.

Dataset

In dataset the features related currency notes are stored these are the feature which is going to compare with the feature of input currency. In Dataset the features of currency like logo, number, amount etc. are stored.

Machine Learning Algorithm

In machine learning algorithm we are using Decision Tree algorithm it will compare all the features of input currency notes it will generate comparison result and send it to the Model Training.

Decision Tree Algorithm

Step-1: Start the tree with the root node, which says S, which contains the complete dataset of currency note.
Step-2: Best attribute in the dataset is find using Attribute Selection Measure (ASM).
Step-3: Dividing S into subsets that contains possible values for the best attributes.
Step-4: It will generate the decision tree node, which contains the best attribute.
Step-5: Recursively it will make new decision trees using the subsets of the dataset created in step 3. Continue this process until a stage is reached where you cannot further classify the nodes and called the final node as a leaf node.

Model Training

In model training the result of comparing will be send how many features are match then in model training it will convert into % then it will generate output based on comparison and send it to the user.

Result

In this block whatever the comparison decision is that will show to the user.

4. CONCLUSIONS

The main motivation behind the development of this application is to provide a better way for people to detect fraud in currency notes. Using image processing analyzing currency image is more accurate. Some features are extracted of paper currency note. In this we are having the six for currency image which we have to extract and the recognition will be working on the basisof these six features. The process of image recognition starts from image acquirement and end comparison of features. This project is very helpful for common people who don't have the any knowledge about currency. Currency image recognition is efficient in terms of cost and time consuming compared to existing techniques. Using Python this project is going to execute.

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6. REFERENCES

[1]. Vishnu R, Bini Omman Department of Computer Science & Engineering. Principal Features for Indian Currency Recognition. IEEE 2014.

[2]. Vedasamhitha Abburu, Saumya Gupta, S. R. Rimitha, Manjunath Mulimani, Shashidhar G. Koolagudi. Currency Recognition System Using Image Processing. IEEE 2017.

[3]. Maur´ıcio Marengoni and Denise Stringhini Faculdade de Computac¸ao e Inform ˜ atica ´ Universidade Presbiteriana Mackenzie Sao Paulo. High Level Computer Vision using OpenCV. IEEE 2011.

[4]. Sapan Thakker1, Prof. Harsh Kapadia2 Nirma University, Ahmedabad. Image Processing on Embedded Platform Android. IEEE 2015.

[5]. Jérôme Treboux Institute of Information Systems University of Applied Sciences, HES-SO Valais Sierre, Switzerland, Rolf Ingold Department of Informatics University of Fribourg Fribourg, Switzerland. Decision Tree Ensemble vs. N.N. Deep Learning: efficiency comparison for a small image dataset. IEEE 2018.

[6]. Cong-Kha Pham The University of Electro-Communications Department of Electronic Engineering 1-5-1 Chofugaoka, Chofu-shi, Tokyo, 182-8585, Japan pham@ee.uec.ac.jp Koutaro Yamano ASTRODESIGN, Inc. Tokyo, Japan. An Edge Extraction Method for Color Image Using Multiple-Valued LoG Filter and Color Space. IEEE 2007.

[7]. Junjun Shang Tianjin Polytechnic University TJPU Tianjin City, China, Yongzhen Ke Tianjin Polytechnic University TJPU Tianjin City, China. An Image Recognition Method Using Multi- features. IEEE 2012.