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A Survey on Automatic Recognition of Fake Indian Currency Note

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Abstract: ***The Currency Recognition System was developed for the purpose of fraud detection in paper currency, so this system is used worldwide. The uses of this framework can be recognized in banking frameworks, cash observing gadgets, cash trade frameworks. This paper proposes an automatic paper currency recognition system through an application developed using Machine learning Algorithms. The algorithm implemented is simple, robust and efficient.***
Keywords: Characteristic extraction, Framework, currency detection

I. INTRODUCTION

A currency is a form of money, issued by the public authorities. It is a account, a store of value and a medium of exchange. It is a monetary denomination, such as the dollar, euro or pound, that is acceptedin payment within a given area or among a specific group of people. Extensive usage of this paper cash can lead to problems in this era of modernization. Counterfeit notes are one such example. To increase the circulation of notes, people tend to produce imitated paper currency which looks exactly like the original notes. To identify the difference between the original and look alike note is a challenge. When such forged notes getinto the cycle of circulation, the economy of the country rapidly decreases. The terrorists use it to cripple the economy of a nation and create an economic terror. Although this fake currency is being printed with precision, there is a chance to detect them with some effort. The local racketeers use photographic methods, hand engraved blocks, lithographic process and color scanning process to manufacture the fake notes. In duplicate notes, the watermark is made by painting with the picture of Mahatma Gandhi. later oilor grease is applied to give translucent feel for the duplicate note. In original notes, the watermark is made using water coated metal stamp or dandy roll. In fake notes, the security thread is imitatedby printing a line using grey ink, or by using aluminum threadwhile pasting two paper sheets but in case of real notes securitythread is incorporated into the paper in the way as woven at thetime of manufacture it consists of micro lettering or individual numbers. Forgers find it difficult to reproduce with the accuracyas the shape of individual numbers and alignment of figures is difficult to imitate. This can be taken as a lead to identify the duplicate notes. This brings motivation to design a system that can detect such counterfeit notes. Currency Recognition System is a technique that aims at identifying the forged notes easily and efficiently. When brought in the form of a mobile application that can be simply downloaded, with one touch the common people can detect the invalid currency. A combination of TensorFlow techniques and OpenCV along with has been used to develop in the system. This app, when passed to all the people of a country, will quickly eradicate the fake notes and aid to the growth of a nationby decreasing the movement of the counterfeit notes.

In the following section, we provide a detail description about recognizing the original and fake notes. In section II we describe the research work performed for building the current system. In Section III we describe in detail the problem, Designand Architecture of the system. In Part IV, we describe algorithms and methods for detecting the denomination of the note. In Section VI the conclusion work for the system is provided.

II. LITERATURE REVIEW

A. *"Automatic recognition of Fake Indian currency Note"*

In this paper, the automatic system is designed for identification of Indian currency notes and check whether it is fake or original. The automatic system is very useful in banking system and other field also. In India increase in the counterfeit currency notes of 100, 500 and 1000 rupees. As increase in the technology like scanning, color printing and duplicating because of that there is increase in counterfeit problem. In this paper, recognition of fake Indian currency notes is done by using image processing technique. In this paper, recognition of fake Indian currency notes is done by using image processing technique. In this technique first the image acquisition is done and applies pre-processing to the image. In pre-processing crop, smooth and adjust then convert the image into grey color after conversion apply the image segmentation then extract features and reduce, finally comparing image.

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B. "Automatic recognition of Fake Indian currency Note using MATLAB"

Counterfeit notes are one of the biggest problem occurring in cash transactions. For country like India, it is becoming big hurdle. Because of the advances in printing, scanning technologies it is easily possible for a person to print fake notes with use of latest hardware tools. Detecting fake notes manually becomes time-consuming and untidy process hence there is need of automation techniques with which currency recognition process can be efficiently done. Many techniques have been proposed with the use of MATLAB, feature extraction with HSV color space and other applications of image processing. We have implemented a fake note detection unit with MATLAB algorithm. This paper is a based on the same project to give solution for fake currency problem.

C. "Fake Indian currency Note Recognition"

In India, money transactions are increasing by the day. These increasing transactions become a cause to increase the currency traverse. Taking advantage of this, fake currency notes of Rs50, 100, 500, 1000 were being produced, and after demonetization the counterfeit notes of new Rs50, 200, 500, 2000 have increased a lot and this in time affects the economic growth of the country. Here, there cognition and verification of the paper currency is explained with the use of image processing techniques. The proposed approach consists of multiple element transactions like Image Acquisition, Feature extraction and comparison, Texture features, and Voice output. The desired results will be in text and voice output of the currency recognized and verified. Thus we can help in reducing the accumulation of counterfeit currency.

D. "An Automated Recognition of Fake or Destroyed Indian Currency Notes"

In India Every year RBI (Reserve bank of India) face the problem on counterfeit currency notes. The bank staffs are specially trained to detect counterfeit notes but problem begins once such notes are mixed into the market and circulated through common people. Even receiving fake notes from ATM counters have also been reported at some places. Over the past few years, as a result of the great technology come a advance in color printing, duplicating and scanning counterfeiting problems become increases. Counterfeit notes are one of the biggest problems occurring in cash transactions. For country like India, it is becoming big hurdle, Because of the advances in printing, scanning technologies it is easily possible for a person to print fake notes with use of latest hardware tools. Detecting fake notes manually becomes time-consuming and untidy process hence there is need of automation techniques with which currency recognition process can be efficiently done. Many techniques have been proposed with the use of MATLAB, feature extraction with HSV color space and other applications of image processing. We have implemented a fake note detection unit with MATLAB algorithm. This paper is a based on the same project to give solution for fake currency problem. In the previous, only the printing house has the ability to make counterfeit paper currency, but today it is possible for any person to print counterfeit bank notes simply by using a computer and a laser printer at house. Therefore to stop these issue The Indian currency notes recognition system is very useful .In order to deal with such type of problems, an automated Recognition of currency notes is introduced with the help of feature Extraction, classification based in SVM, Neural Network .To implement this design we are dealing with MATLAB Tool.

E. "Detection of Fake Currency using Image Processing"

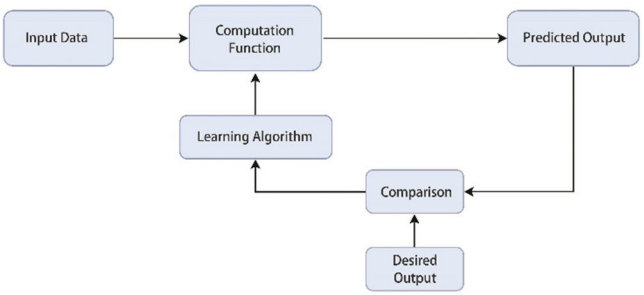
The main objective of this project is fake currency detection using the image processing. Fake currency detection is a process of finding the forgery currency. After choose the image apply pre-processing. In pre-processing the image to be crop, smooth and adjust. Convert the image into gray color. After conversion apply the image segmentation. The features are extracting and reduce. Finally compare the image into original or forgery.

III. MACHINE LEARNING

The Main goal of machine learning is to study, engineer, and develop mathematical models, which can be trained with context-related data (provided by generic environment), to infer the future and to make decision without complete Knowledge of all influencing elements.

Machine learning is the field of artificial intelligence, which educates computer on how to perform complex task. With machine learning software application can learn to increase their accuracy of expected outputs. In this application across business problems, machine learning is also referred to as predictive analytics

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IV. EXISTING SYSTEM

Manual testing of notes in transactions is very time consuming and confusing process and also there is a chance of missing while handling notes. Therefore automatic detection for bank note recognition is required in many applications such as automatic selling goods.

In Existing System there was following features as follow

A. PC

In PC the MATLAB is used for this system. This is used for image processing and to apply User Interface which runs on the PC. Communication with the microcontroller is done using serial communication. In MATLAB the PCA technique is used for recognition of Indian currency.

B. Fake Note Detection Unit

The system uses signal conditioning to identify whether the note is fake or real. For this, note goes through UV light to detect the originality of the note. The original currency absorbs the UV light and the fake currency reflects the UV light. The conditioning and testing is done using a UV LED transmitter and UV receiver.

C. Camera

Camera is used for image acquisition. It will take picture of incoming note and picture is forward to processing unit. After suitable image processing signal will be produced.

V. EXPECTED RESULT

Here in this the system will take currency image from the user through the network the system will extract the features and display. The system will give reply if It will match image kept in server and recognize whether the currency note is fake or not.

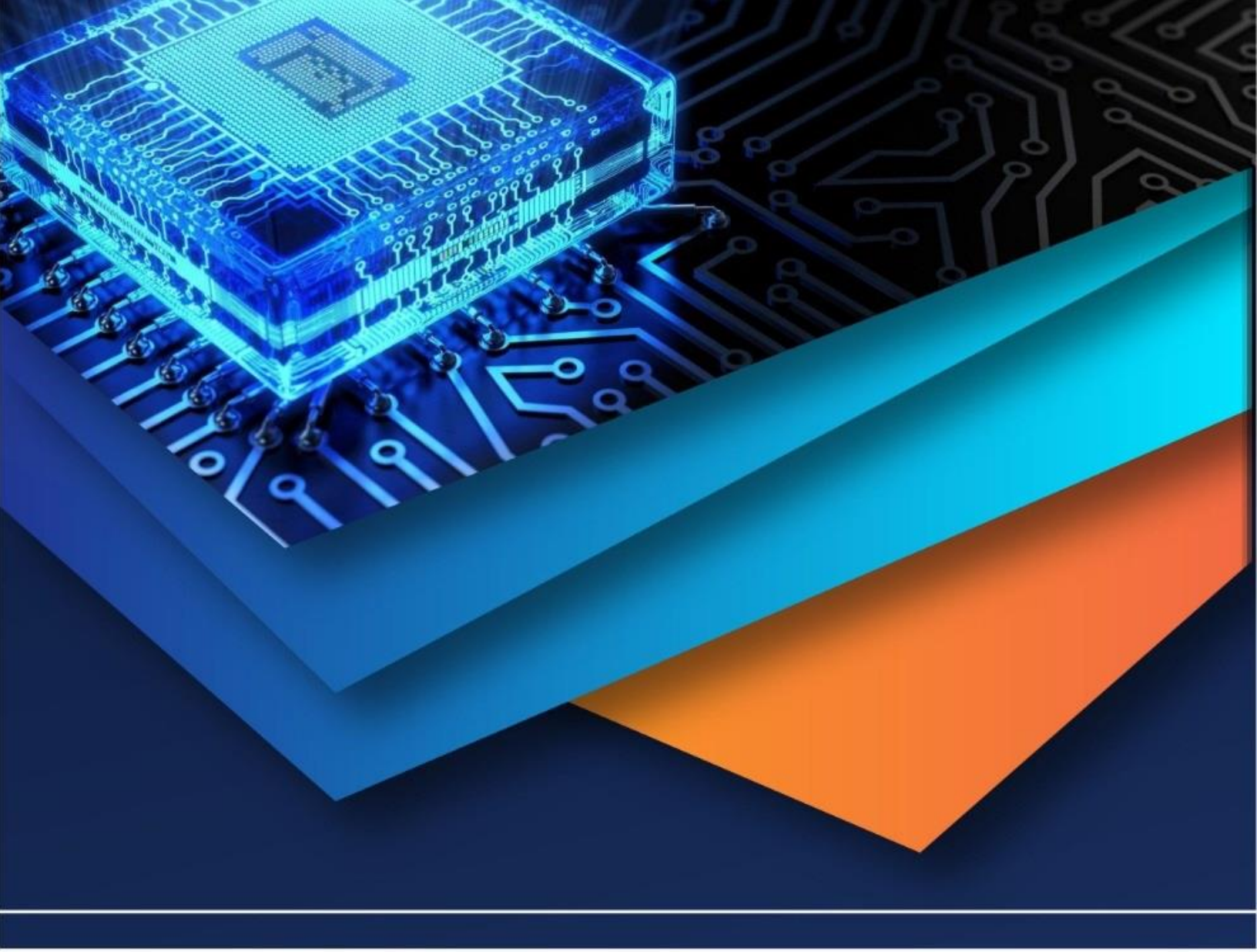
VI. CONCLUSION AND FUTURE SCOPE

In the existing system, detection of fake Indian currency note is done by using image processing principle. This is the low-cost system. The system works for denomination of 100, 500 and 1000 for Indian currency. The system also provides accurate and valid results. But in our proposed system we have used machine learning algorithm like TensorFlow which will detect the fake Notes and In future we can expand this project by using some more algorithm which is fast and efficient.

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