

A Hybrid Fake Banknote Detection Model using OCR, Face Recognition and Hough Feature

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Abstract: In this paper, the programmed framework is intended for ID of Indian cash notes and check whether it is phony or unique. The programmed framework is extremely valuable in banking framework and other field too. In India expansion in the fake money notes of 100, 500 and 1000 rupees. As expansion in the innovation like filtering, variety printing and copying due to that there is expansion in fake issue. In this paper, acknowledgment of phony Indian cash notes is finished by utilizing picture handling method. In this paper, acknowledgment of phony Indian money notes is finished by utilizing picture handling strategy. In this strategy first the picture obtaining is finished and applies preprocessing to the picture. In pre-handling harvest, smooth and change then, at that point, convert the picture into dim variety after change apply the picture division then, at that point, separate elements and diminish, at last looking at picture.

Keywords: Fake currency, counterfeit detection, image processing, feature extraction.

INTRODUCTION

In the last eight years more than 3.53 lakh cases of counterfeit currency detection in India's banking channels is heighten according to latest government reports. The practice of counterfeiting became more refined with the arrival of paper currency. The Indian Government has taken a astonishing stride of demonetizing 500 and 1000 Rs. notes. Prime Minister Shree. Narendra Modi stated that one of the cognition for this policy was to counter the climbing menace of counterfeit Indian Currency notes. However, the Indian banks acknowledged an all- time peak amount of fake currency and also noticed an over 480% increment in doubtful transactions after demonetization, a first ever report on questioning credits ended in the wake of 2016 notes ban has discovered. The Reserve Bank of India (RBI) is the only one which has the singular authority to issue bank notes in India. The RBI being the highest monetary authority in the country prints the currency notes of all denominations from Rs.2 to 2000. Several security features have been published by the RBI so that the counterfeit notes can be detected by the general public. However, distinguishing a counterfeit note just by visual per lustration is not an easy task. Moreover, an average person is unaware of all the security features. Developing applications which can detect a currency note to be counterfeit by a camera image can help solve this problem. Deep learning models have witnessed a tremendous success in image classification tasks. Our model proposes a binary image classification task with two classes-fake or real. The Deep RNN model we have built helps us detect the counterfeit note without actually manually extracting the features of images. By training the model on the generated dataset, the model learns on it and helps us detect a counterfeit note.

LITURATURE SURVEY

In present scenario, the Indian government has announced the demonetization of all Rs 500 and Rs 1000, in reserve bank notes of Mahatma Gandhi series. Indian government has introduced a new Rs 500 and Rs 2000, to reduce fund illegal activity in India. Even then the new notes of fake or bogus currency are circulated in the society. The main objective of this work is used to identify fake currencies among the real. From the currency, the strip lines or continuous lines are detected from real and fake note by using edge detection techniques. HSV techniques are used to saturate the value of an input image. To achieve the enhance reliability and dynamic way in detecting the counterfeit currency [1.]

Counterfeit currency is one of the threats which creates vice to nation's economy and hence impacts the growth worldwide. Producing forge currency or fabricating fake features in the currency considered to be a crime. Currency crime comes under the criminal law and known to be as Economical crime. Over the past few years many researchers have proposed various techniques to identify and detect forged currency. The serious problem has been come up with variety of solutions in terms of hardware related techniques, Image processing and machine learning methods. Advancements in printing and scanning technology, trading of material are some of the problems in germinating counterfeit currency. The study presents various fake currency detection techniques proposed by various researchers. The review highlighted the methodology implemented on particular characteristics feature with success rate of each method to detect counterfeited currency. Moreover, the study includes the analysis of widely acceptable statistical classification technique for currency authentication. The comparative analysis of Logistic Regression and Linear Discriminant Analysis (LDA) was performed to realize the better model for currency authentication. It has been found that classification Model using Logistic regression shows better accuracy of 99% then LDA. The study will benefit the reader in identifying most feasible technique to be implemented based on the accuracy rate [2].

Bank note identification is most important approach based on an image processing method. Many techniques and methods are studies involved in the classification of bank notes from different countries conducted experiments on separated image data sets of each country's. Deep learning is machine learning technique that analyze & learns the features of original note. The most important aspect is to find more essential features by using neural networks. In the era of big data where for any real world application, large amount of data has to be processed, deep learning is the superior techniques. In this research, we studied bank note of various

countries by extracting its features in depth and analysis it using deep learning. Our system recommended a deep learning-based algorithm to detect Forged bank note through general scanners that can be used by persons to prevent personal monetary damages caused by fake bank note [3].

The one important asset of our country is Bank currency and to create discrepancies of money miscreants introduce the fake notes which resembles to original note in the financial market. During demonetization time it is seen that so much of fake currency is floating in market. In general, by a human being, it is very difficult to identify forged note from the genuine not instead of various parameters designed for identification as many features of forged note are similar to original one. To discriminate between fake bank currency and original note is a challenging task. So, there must be an automated system that will be available in banks or in ATM machines. To design such an automated system there is need to design an efficient algorithm which is able to predict whether the banknote is genuine or forged bank currency as fake notes are designed with high precision. In this paper six supervised machine learning algorithms are applied on dataset available on UCI machine learning repository for detection of Bank currency authentication. To implement this we have applied Support Vector machine, Random Forest, Logistic Regression, Naïve Bayes, Decision Tree, K- Nearest Neighbor by considering three train test ratio 80:20, 70:30 and 60:40 and measured their performance on the basis various quantitative analysis parameter like Precision, Accuracy, Recall, MCC, F1-Score and others. And some of SML algorithm are giving 100 % accuracy for particular train test ratio [4].

In today's world scenario, paper currency is economical in the sense that its face value is greater than intrinsic value. It is also more elastic and stable, paper currency can be counted quickly, it is easy to move and safe to store. These all are the main reasons because of which counterfeit currency recognition is crucial. Fake currency cannot be identified by human vision and due to this recognition of forged currency notes has become crucial problem because counterfeiters are using new and improved methods. The methods currently existing to determine whether the notes are real cannot be accessed by the common people and are also complex hardware-based methods. There are no applications or devices available through which fake currencies can be detected and identified easily by common people. The main purpose of the project is to identify Indian "DETECTION OF INDIAN CURRENCY NOTES USING DEEP LEARNING TECHNIQUES" Paper currency with a new methodical approach using Generative Adversarial Networks (GAN). In this system, the Indian currency note features would be primarily extracted using Convolutional Neural Networks (CNNs). The processed image data are then fed to a Generative Adversarial Network which helps to classify the currency as either real or fake. GAN consists of two main modules – Generator and Discriminator. The Generator generates fake currency images and the Discriminator identifies and labels the real and fake images [5].

AIM & OBJECTIVES

- To design a system to detect the currency note easily.
- To Avoid Time Consuming process of detection fake currency
- To Avoid High cost machine
- To develop Web-based app (software) for user interface.

MOTIVATION

Automatic identification of fake note is very crucial in some areas like banking, jewellery shops nowadays. This method is used to find whether the note is genuine or duplicate, by the automated system which is by convolution neural network, in intense learning. Intense learning shines in the task of identification and dividing the images over a huge data collection. The demonetization drive is a tramp to eradicate manipulation and black currency notes, but it badly fails to find the problems of counterfeit currency. An intense neural network is a mathematical model that works in a close trend to the neurons in our brain.

PROPOSED SYSTEM

Input as currency note: user will put the image of currency note for identification.

Training data: Here we use note image as input. Training data is the data you use to train an algorithm or machine learning model to predict the outcome you design your model to predict.

Data cleansing: In this process there is cleansing process of currency note image i.e., fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset.

Data augmentation: Data augmentation in data analysis are techniques used to increase the amount of data by adding slightly modified copies of already existing data or newly created synthetic data from existing data. It acts as a regularize and helps reduce over fitting when training a machine learning model.

Data preprocessing: Data Processing is the task of converting data from a given form to a much more usable and desired form i.e. making it more meaningful and informative. Using Machine Learning algorithms, mathematical modeling, and statistical knowledge, this entire process can be automated.

Data prediction: Predictive analytics is the process of using data analytics to make predictions based on data. This process uses data along with analysis, statistics, and machine learning techniques to create a predictive model for forecasting future events.

Output: at output user will get currency result as fake or real.

SYSTEM ARCHITECTURE

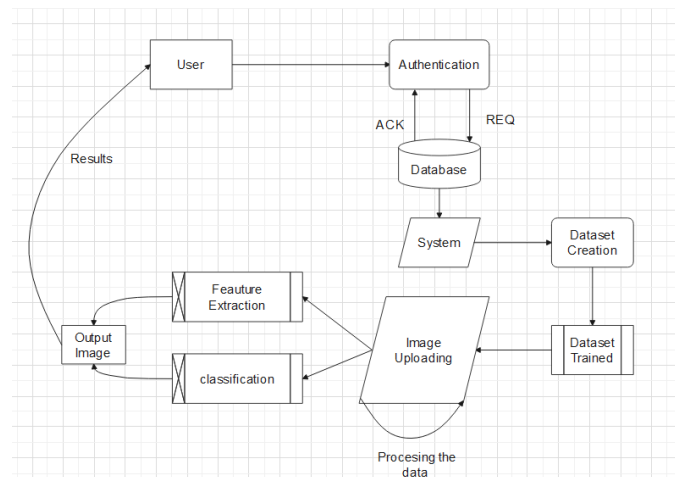


Fig -1: System Architecture Diagram

APPLICATION

1. Banking
2. Organization
3. Petrol Pumps
4. Personal. SMS Alerts
5. Notification to Nearest Police Station in case of Emergency
6. Comfortable Wearable Device for Children.
7. Mobile App Alerts

APPLICATION:

1. Child safety.
2. Women safety.
3. Blind people security.

FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS

Functional requirements: may involve calculations, technical details, data manipulation and processing and other specific functionality that define what a system is supposed to accomplish. Behavioral requirements describe all the cases where the system uses the functional requirements; these are captured in use cases.

Nonfunctional Requirements: (NFRs) define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions on the design of the system across the different backlogs.

Functional requirements

- Registration
- User Login
- Creation of database:
- Users Mandatory Information

Design Constraints:

1. Database
2. Operating System
3. Web-Based Non-functional Requirements

Security:

1. User Identification
2. Login ID
3. Modification

Performance Requirement:

1. Response Time
2. Capacity
3. User Interface

Maintainability

Availability

SYSTEM REQUIREMENTS

- **Software Used:**
 1. Python 4.4 or above
 2. Jupyter
 3. VS code / pycharm
- **Hardware Used:**
 1. I3 processor
 2. 150 GB Hard Disk
 3. 6 GB RAM

CONCLUSION

It is proposed to design a system to detect fake Indian currency notes. The deep learning approach will be used to detect fake Indian currency notes. The system will improve the accuracy of detection of fake currency notes. It will overcome the drawback of existing system such as minor contents in the notes. It will also check the security feature in note such as watermark, script, signature etc. This system is cost effective and efficient system.

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