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Detection Of Fake Bank Currency Using Machine Learning

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Abstract: The development of colour printing technology has accelerated the production of counterfeit currency notes and their mass duplication. Counterfeiting of banknotes poses a significant threat to the financial system and undermines the integrity of currency .Image analysis to distinguish genuine banknotes from counterfeit ones based on distinctive features. Various image processing algorithms are then employed to extract key features, such as texture, colour, and security elements embedded in the banknotes. These features are crucial for differentiating authentic currency from counterfeit replicas .Machine learning algorithms, particularly deep neural networks, are employed to train a robust classification model using a labeled dataset containing examples of both genuine and fake banknotes. The model is designed to generalize well to unseen data, allowing for accurate detection of counterfeit currency across various denominations and designs. The proposed fake banknote detection system demonstrates promising results in terms of accuracy, speed, and scalability. It offers a reliable and efficient solution to financial institutions and law enforcement agencies for identifying counterfeit currency in real-time, thereby contributing to the preservation of the integrity of financial transactions and safeguarding the economy against illicit activities.

Keywords:- KNN, SVM, Image Processing

I . INTRODUCTION

Fake currency is the plutocrat produced without the concurrence of the gov, creation of it's considered as a crime. The elevation of color printing technology has increased the rate of fake currency note printing on a veritably large scale. Times ahead, the printing could be done in a print cafe, but now anyone can publish a note with important delicacy using a simple ray printer. This results in the printing of fake notes rather of the real bones has been increased veritably much. It's the biggest problem faced by utmost of the countries including India. Though Banks and other large associations has installed numerous machines to descry fake currency notes, it's really delicate for an average person to distinguish between the two. This has led to the increase of corruption and product of fake notes in our country hindering our country's growth. Some of the styles to descry fake currency are watermarking, security thread, idle image, ways like fake discovery pens. Project aims at observing images taken as input that's grounded on parcels taken out after metamorphosis and also on the problem grounded on machine literacy. Machine literacy is going to use pattern recognition as well as image processing for assaying the real parcels. thus, the processes continued with analysis of images, to check their correctness by testing the data set with respect of set proposition, which will be visible but not mentioned in the model, for achieving delicacy. II. LITERATURE REVIEW 1) Aman Bhatia, Vansh Kedia, Anshul Shroff, Mayand Kumar, Bickey Kumar Shah, Aryan, The paper proposes a system for detecting fake currency using machine literacy algorithms and image processing ways. The approach involves assaying colorful features of currency notes, similar as texture, watermark, and periodical number, to distinguish between real and fake notes. The proposed system achieved a high delicacy rate in detecting fake currency.(2) Megha Jadhav, Yogesh kumar Sharma,G.M. Bhandari, The paper proposes a system that uses deep literacy ways, specifically convolutional neural networks, for automatic discovery of forged bills and identification of the currency denotation from images captured under varying lighting conditions. The proposed system achieved high delicacy in currency identification and forged bill discovery.(3) Asfaw Shefraw Alene, Dr, Million Meshesha, The paper proposes an optimal point birth fashion for the recognition of Ethiopian paper currency using machine literacy. The proposed system achieved high delicacy in feting different appellations of Ethiopian currency notes.(4) Veling, Miss. JanhaviP. Sawal, Miss. SiddhiA. Bandekar, Mr. Tejas C. Patil, Mr. Aniket L. Sawant, The paper proposes a method for recognizing fake Indian currency using image processing techniques and machine learning algorithms in MATLAB. The proposed system analyzes various features of the currency note and classifies it as genuine or fake with high delicacy.(5) Kiran

Kamble, Anuthi Bhansali, Pranali Satalgaonkar, Shruti Alagundgi, The paper presents a system for detecting fake currency using a deep convolutional neural network. The approach involves training the network on a dataset of real and fake currency images and using it to classify new images as real or fake with high delicacy. The proposed system shows promising results in detecting fake currency.(6)G.Hariharan,D.Elangovan, The paper proposes a system for feting and eradicating makeshift notes using image processing ways and deep literacy. The process involves image accession,pre-processing, segmentation, and deep literacy using a CNN algorithm. The system utilizes anisotropic prolixity pollutants, adaptive consonance mean enhancement, and adaptive region growing segmentation to enhance the quality of images and excerpt image characteristics. The limitations include high time consumption for better delicacy using the CNN algorithm. The proposed system has the implicit to ameliorate translucency and responsibility in the electoral process.(7) Vanajakshi, Veena, Yadhunandan,Sowjanya.U, Anitha, The paper proposes a system for detecting fake Indian currency notes using image processing ways. The system involvespre-processing the input image, segmenting the note region, rooting features, and using a classifier to determine whether the note is genuine or counterfeit.

III.EXISTING SYSTEM

The rearmost government report shows that there has been a 400 increase in similar fake deals. According to the Indian law, enjoying fake notes is a punishable offence. Fake Indian currency note(FCIN) is a term used by officers and media to relate fake currency notes circulated in the Indian frugality. The fake notes of recently introduce INR 2000 and INR 500 series are so perfect that it's hard to identify them from the real notes.

IV.PROPOSED SYSTEM

It's a common name for operations with images at the smallest position of abstraction; both input and affair are intensity images. The end of preprocessing is to ameliorate the image data that suppresses unwanted deformations or enhances some image features important for farther processing. Imagepre-processing styles use the considerable redundancy in images.

V.ARCHITECTURE

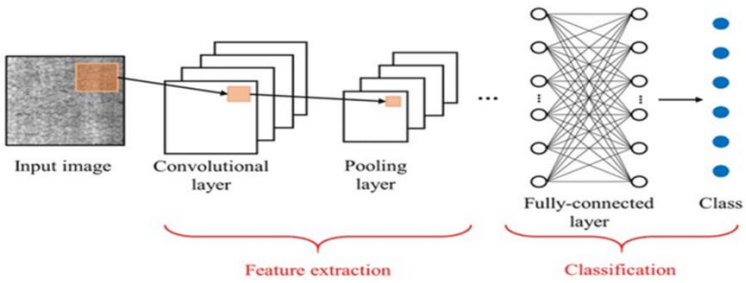

Figure 1 Detection Of Fake Bank Currency Architecture

The armature of a proposed system for image processing, specifically for double bracket tasks. It consists of multiple layers of Convolutional Neural Networks(CNNs) followed by activation functions, maximum pooling layers, and completely connected layers. The first subcaste is a Conv2D subcaste with 32 pollutants of size(2, 2) and the input shape of the images is specified asinput_shape. The activation function used after this subcaste is ReLU, which helps in introducingnon-linearity into the model. The coming subcaste is a MaxPooling2D subcaste with pool size(2, 2) which reduces the dimensionality of the point maps and helps in avoiding overfitting. The same pattern is repeated for the coming two layers, with 32 pollutants of size(2, 2) and 64 pollutants of size(2, 2), independently. After each Conv2D subcaste, an activation function and a MaxPooling2D subcaste are added. The final subcaste of the model is a thick subcaste with 64 units followed by an activation function. A powerhouse subcaste is added to help overfitting, with a powerhouse rate of0.5. The final thick subcaste consists of a single unit with a sigmoid activation function, which produces the double bracket affair. Overall, this armature consists of a combination of convolutional and completely connected layers, which is a common approach in designing CNN models for image processing tasks.

VI.IMPLEMENTATION

Preprocessing of Data The simplest way to get the data without overfitting and under fitting is topre-process the data- set. The main end behind the data preprocessing is that to add a value to the base value which is the data- set generated. The main advantage of datapre-processing is to get a better training- set. For these purposes, we use Keras library forpre-processing the images. point birth In this part, the network will perform a series of complications and pooling operations during which the features aredetected.However, this is the part where the network would fete its stripes, two cognizance, If you had a picture of a zebra. Result Analysis Then the delicacy of bracket is shown among delicacy is the fake or real. Visual Representation Our final results are colluded as graphs which contains different fields similar as CNN Training Model Accuracy. Pictorial representation is the stylish way to convey information without important sweats.

VII. METHODOLOGY

Detecting fake bank currency using machine literacy involves several way. Below is a general methodology that you can follow

1. Data Collection
Gather a different dataset of both genuine and fake bills. Make sure the dataset is representative of the variations in genuine and fake currencies.
insure the dataset includes images with different lighting conditions, exposures, and backgrounds.

2. Data Preprocessing
Resize images to a harmonious resolution.
Convert images to grayscale or RGB, depending on the chosen model armature.
homogenize pixel values to a standard scale(e.g., 0 to 1).
compound the dataset to increase variability(e.g., rotate, flip, and acclimate brilliance).

3. Point birth
Choose an applicable point birth system. You can usepre-trained deep literacy models like Convolutional Neural Networks(CNNs) for point birth.
Alternately, traditional computer vision ways like Histogram of acquainted slants(overeater) can be used.

4. Model Selection
Choose a suitable machine literacy model for bracket. Common choices include Support Vector Machines(SVM), Random timbers, or deep literacy models like CNNs.
Consider usingpre-trained models and fine- tuning them on your dataset.

5. Model Training
Split your dataset into training and testing sets.
Train your chosen model on the training set.
Tune hyperparameters to achieve better performance.

6. Evaluation
estimate the model's performance on the testing set using criteria like delicacy, perfection, recall, and F1 score.
use a confusion matrix to understand false cons and false negatives.

7. Processing
utensilpost-processing ways to enhance the model's prognostications. This may include thresholding chances or filtering out doubtful prognostications.

8. Deployment
Integrate the trained model into your operation or system.
insure the model is able of real- time or batch processing, depending on your conditions.

9. Nonstop enhancement
Examiner the model's performance over time.
Consider retraining the model periodically with new data to acclimatize to arising fake patterns.

10. Ethical Considerations
Be aware of implicit impulses in your dataset that might affect the model's performance, and address them consequently.
easily communicate the limitations of the model and give translucency regarding its decision- making process.
Flash back that the effectiveness of the model depends on the quality and diversity of your dataset, the chosen features, and the named model armature. also, legal and ethical considerations should be taken into account when developing systems for detecting fake currency.

VIII. Data Flow Diagram

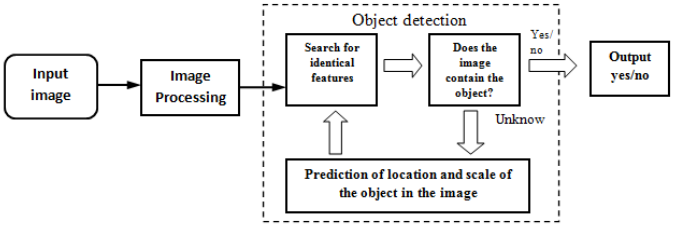

Figure 2: Detection Of Fake Bank Currency DATA FLOW

Qualitative Results.

Figure 3 : Here we have to choose image

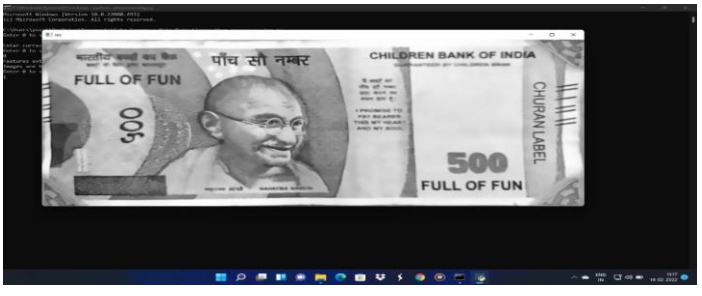

Figure 4 : Image Acquisation – Here image will get resized based on pixels

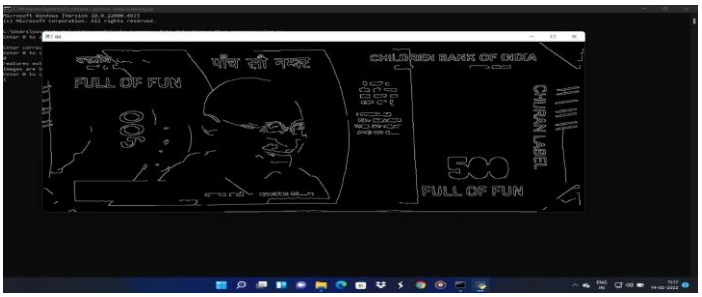

Figure 5 : Pre-Processing – Converts RGB to Gray color

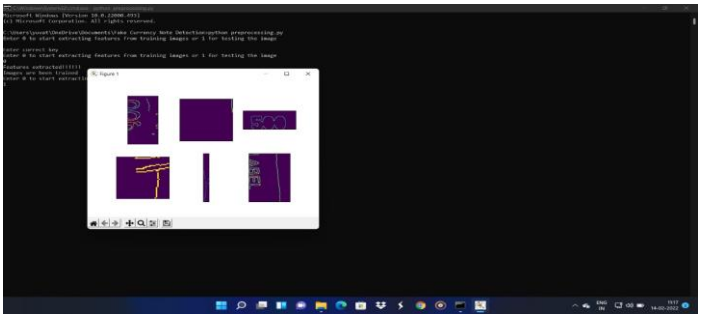

Figure 6 : Edge Detection – Detects Edges in Image

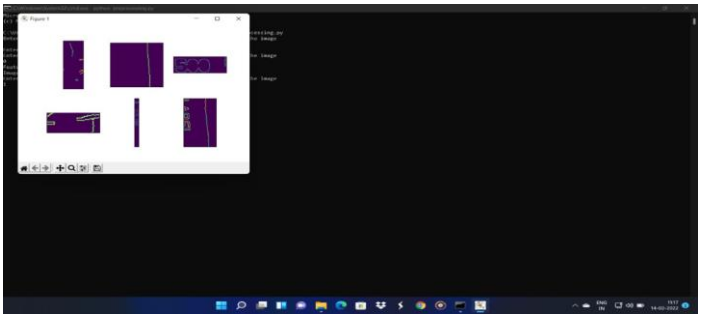

Figure 7 : Segementation – Here feature extraction technique is Used

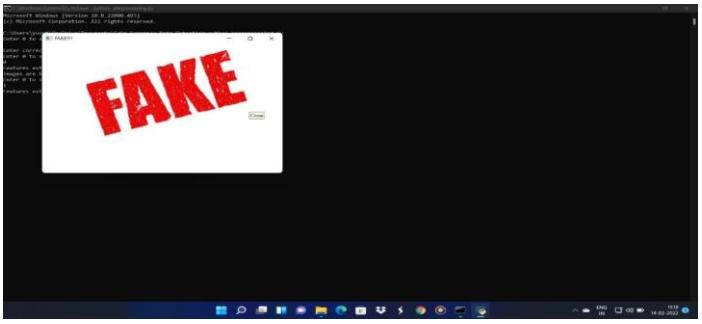

Figure 8 : Classification – Here its shows whether the currency is fake or not.

VII. CONCLUSION

In this work, we've bandied that how our proposed system detects the fake bank currency using machine literacy algorithms. The proposed system is also scalable for detecting the whether the currency is fake or not by image processing. The system isn't having complex process to descry the whether the data contains fake bank currency like the being system. Proposed system gives genuine and fast result than being system. Then in this system we use cnn algorithm to descry whether currency is fake or not.

VIII . REFERENCES

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