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# An Efficient Identify Of Fake Currency Using Deep CNN

**A. ANURADH, P.CHIRAN**

**[1]Assoc. Professor [M.Tech], Department of AI&IT, DVR &DR. HS MIC College of Technology, Kanchikacherla, Krishna (DT).**

**ABSTRACT:** Bank cash is our country's most valuable asset, thus counterfeiters who want to cause havoc in the financial sector print counterfeit bills that seem quite similar to real ones. Because many qualities of a forged note are identical to those of the actual one, it is very impossible for a person to distinguish between the two without the use of different factors established for identification. Identifying genuine banknotes from counterfeits is a difficult undertaking. High-powered computational and mathematical methodologies were used to generate the banknote authentication dataset, which accurately represents the entities and properties of currency notes. Machine learning algorithms and image processing are used to analyze and extract data for better accuracy and efficiency.

**Key words:** Bank Data Processing, Convolutional Neural Nets, Feature Extraction ,Image Processing,

## 1. INTRODUCTION

Financial activities are carrying out in every second by many persons in which one most important asset of our country is Banknotes [3]. Fake notes are introduced in the market to create discrepancies in the financial market, even they resemble to the original note. Basically they are illegally created to complete various task [12]. Fake Indian Currency Note (FICN) is a term used by officials and media to refer to counterfeit currency notes circulated in the Indian economy. In 2012, while responding to aquestion in parliament, the Finance Minister,

P. Chidambaram, admitted that there is no confirmed estimate of fake currency in India. However, several central and state agencies are working together, and the Ministry of Home Affairs has constituted the Fake Indian Currency Notes Co-ordination Center (FCORD) to curb this menace. Automatic currency note recognition

technology is specific to a country and can be generalized with standard banknotes of each country. If there is a system which can identify a currency note as fake through a camera image is one promising direction towards solving this problem. Convolutional neural network models have seen tremendous success in image classification tasks. And identifying a currency note as fake or real from its image is essentially a binary image classification task. Here we test the feasibility of CNN models for fake currency identification, which can be trained without manual feature extraction on raw images of currency notes with a simple, efficient and very accurate approach.

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 [9]. 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 [8] 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 [4]. Our model proposes a binary image classification task with two classes-fake or real. The Deep CNN 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.

## 2. LITERATURE REVIEW

Sawant et al. [5] used image processing techniques and minimum distance classifier techniques of scanned currency images. The research used stand color extraction, segmentation, feature extraction using Fourier Descriptors and identification of the shapes through the extraction of the unique identification marks and latent image numbers using the Minimum Distance Classifier. The method reported accuracy close to 90%.

Manikandan [6] proposed a currency recognition system for mobile application for visually challenged people based on currency localization techniques. The study used the Matlab image processing toolbox libraries. The system captured images with the mobile camera and uses morphological techniques, to identify the different currency notes. The currency recognition system provided an accuracy of 93% based on adata set of 165 images.

The authentication of Currency Notes using printing technique verification has also been shown to be a valid method. Roy et al. [7] verified the notes checking physical dimensions, paper quality, design, and the printing technique. A K-mean algorithm was used to check whether the cluster was linearly separable. The classification accuracy was also checked using a Neural Network (NN)-based classifier Other techniques such as edge detection of grayscale images of the currency have proved to be satisfactory. A study by Prasanthi et al. [8] proposed a system which used six different characteristic features of the paper currency. The characteristics of the paper were extracted from these

attributes. Comparison of notes was carried out with the original pre-stored image in the system. If the conditions were satisfied, thenthe currency was said to be genuine otherwise counterfeit.

## 3. EXISTING SYSTEM

In existing project, review of those applied machine learning approaches to classify whether not is original or not. Yeh et. al. implemented SVM based on multiple kernels to reduce false rate and compared with SVM (single kernel). To classify real and forged network. Author's Hassan pour et. al. used texture-based feature extraction method for the recognition and to model texture Markov chain concept is used. This method is able to recognize different countries' currencies. To classify whether the note is forged or not global optimization algorithms are applied in Artificial Neural Network (ANN) training phase, and they have observed good success in classificationof note.

**DISADVANTAGES:**

- Accuracy is Low.
- The technology is increasing very vastly that will help the frauds to generate fake note whose resemblance is like genuine not and it is very difficult to discriminate them

## 4. PROPOSED SYSTEM

Fake currency is serious issue worldwide, affecting the economy of almost every country including India. The counterfeit currency is one of the major issues faced throughout the world nowadays. The counterfeiters are becoming harder to track because of their use of highly advanced technology. One of the most effective methods to stop counterfeiting is the use of counterfeit detection software that is easily available and is efficient. The background of our topic is image processing technology and applies it for the purpose of verifying valid currency notes. The software will detect the fake currency by extracting features of notes. The success rate of the software can be measured in terms of accuracy and speed. So our aim is to work on those parameters which will be impossible to implement on counterfeit notes so we started working on parameters which will be enough to differentiate between fake and original notes

## 5. ARCHITECTURE DIAGRAM

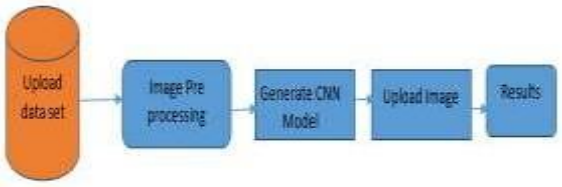



**Fig.1.** Architecture

## 6. IMPLEMENTATION

**Preprocessing of Data:**

The simplest way to get the data without over- fitting and under fitting is to pre- process the data- set. The main aim behind the data pre-processing is that to add a value to the base value which is the data-set generated. The main advantage of data pre- processing is to get a better training-set. For these purposes, we use Keras library for pre-processing the images.

**Feature Extraction:**

In this part, the network will perform a series of convolutions and pooling operations during which the features are detected. If you had a picture of a zebra, this

is the part where the network would recognize its stripes, two ears, and four legs. **Result Analysis:**

Here the accuracy of classification is shown among accuracy is the fake or real.

**Visual Representation:**

Our final results are plotted as graphs which contains different fields such as CNN Training Model Accuracy. Pictorial representation is the best way to convey information without much efforts.

## 7. METHODOLOGY

"Deep learning is a sub-field of machine learning dealing with algorithms inspired by the structure and function of the brain called artificial neural networks". Let's see what exactly that means: In other words, deep learning mirrors the functions of our brain. The algorithm of deep learning

In a proposed system, we are proposing experiment on genuine or real fake currency with limited set of supervised data. We are proposing a Convolutional neural network based multimodal classes risk prediction model for limited notes with higher accuracy. We are going to solve accuracy issue in diagnosis ofgenuine or fake with accurate stage predictions. Convolutional Neural Networks (CNN)

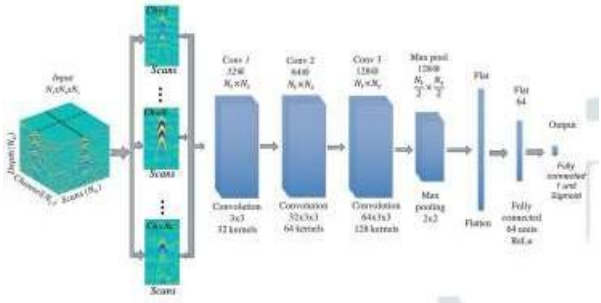
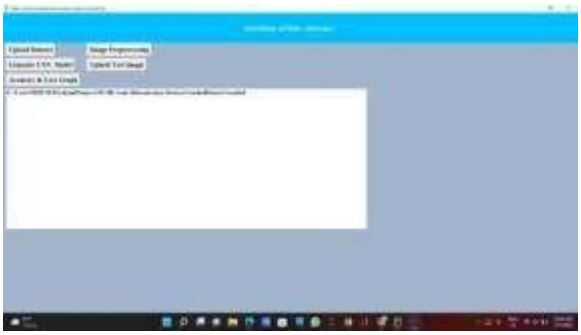


**Fig.2.** CNN Architecture Convolutional Neural Networks (which areadditionally called CNN/ConvNets) are a kindof Artificial Neural Networks that are known tobe tremendously strong in the field of

distinguishing proof just as picture order. Four main operations in the Convolutional Neural Networks are convolutional layer, max pooling layer, relu and fully connected layer.

## 8. SCREEN SHOT



## 9. CONCLUSION

Deep learning has gained tremendous success in image classification tasks. Our architecture which is based on Deep CNN works as feature extractor eliminating the need to apply image processing technique and manually checking the presence of security features in the note. The generated dataset has successfully helped conduct experiments and tried to mimic the real- world scenario. The application built will be useful to any common person to detect a counterfeit note. Future scope includes trying out new Deep CNN architectures to increase the accuracy of the model.Increasing the data-set, so that the modelgets trained better and produce better results

### FUTURE SCOPE

Further, the other side of the issue is the problem of visually impaired people to recognize bank currency .In specific, we explored the applications of pre-trained deep learning models, like VGG16, Google Net and Mobile Net for currency classification and fake currencydetection.

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