

# Fake Indian Currency Detection Using CNN

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## ABSTRACT

*In recent years a lot of fake currency note is being printed which have caused great loss and damage to the society. So, it has become the necessity to develop a tool to detect the fake currency. We considered the Indian currency detection which makes useful to our country. This project proposes an approach that will detect the real and fake currency note being circulated in our country by using the image. So, for that we chose the CNN which plays a vital role, which is a present growing technique and we are using cloud storage to make efficient.*

## I. INTRODUCTION

Fake currency detection is a serious issue in society, which affecting the economy growth almost all countries including India. Currency duplication also known as counterfeit currency is a vulnerable threat on economy. It is now common phenomenon due to advanced printing and scanning technology. So the possibility is to use the chemical properties in the currency or using a physical appearance like detecting machines. The approach we presented is physical approach which uses the CNN model using python programming language. Here we extract the features of image through training an image and provided the user friendly thing by including images through cloud storage.

## II. EXISTING METHOD

In the existing system the fake currency is detected using the ImageProcessing technique. They used the image segmentation method which makes to divide the image into multiple parts. This is typically used to identify the objects or relevant information in the digital images. The image is applied to the segmentation after the grey scale conversion and edge detection.

A pixel colour in an image is a combination of three colours Red, Green, and Blue (RGB). The grey scale conversion is a methodology which converts the RGB image into the grayscale image. In the edge detection boundaries of object within an image is found through Canny Edge detection is a technique used to extract the useful structural information from different objects.

After the segmentation the feature extraction and comparison is done. The MATLAB programming language is used in the existing system. Finally the output is displayed on the Screen.

As the MATLAB code increase the complexity and has less accuracy than compared to other trending techniques. As the code lines increases the execution time is also increases in MATLAB.

### III. PROPOSED METHOD

The contribution of this project will be two folds; one is to develop a new database for a Currency Notes and the other is to develop and design a deep CNN architecture for Fake currency detection. The collected data set is given as an input to the proposed CNN architecture for training, validation and testing. Once the CNN is trained, it is ready to be used for classifying new images which were not part of the collected dataset.

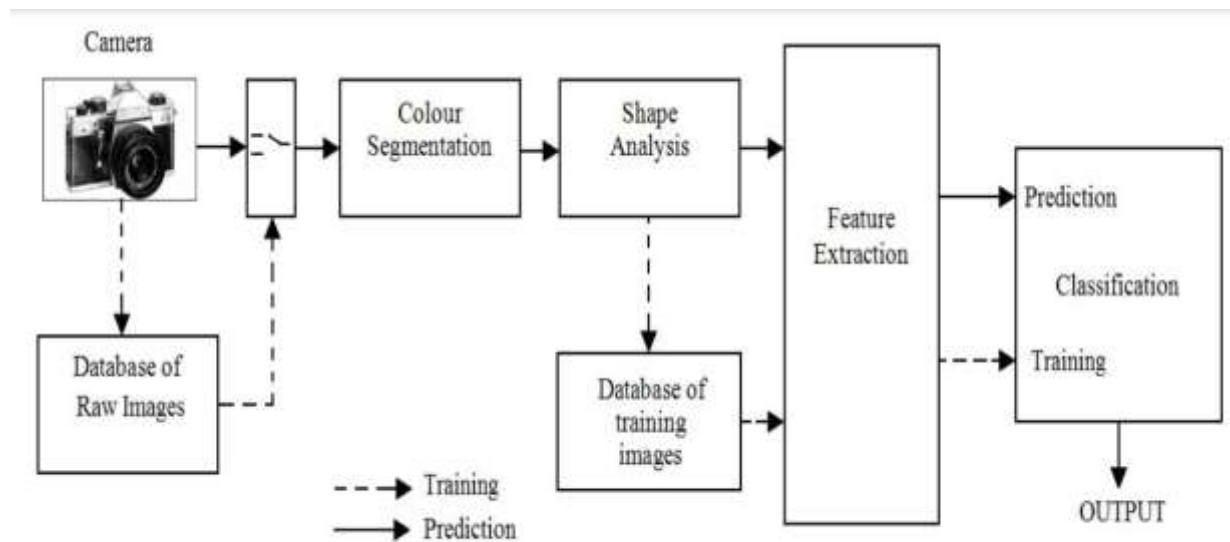


Figure: Working of Training and Prediction

The implementation of the classification algorithm for the Fake currency detection task Combined with pre-processing and localization steps from previous works, the proposed method for Fake currency detection by Using CNN. The proposed classification solution is implemented using the Tensor Flow framework. The important aspects of the project are to train the dataset and extract the features of an image.

A system to detect and recognize Fake currency notes should be able to work in two modes; the training mode in which a database can be built by collecting a set of Original and Counterfeit currency notes for training and validation, and a prediction mode in which the system can recognize a Currency note which has not been seen before. A system to Fake Currency is depicted in below Figure. It consists of a number of modules which work together to perform this recognition.

### IV. WORKING

Convolutional neural networks (CNN) can be used to detect counterfeit currency. CNNs are a class of deep learning neural networks designed specifically for image processing tasks and are widely used in various computer vision applications such as object detection, image recognition, and face recognition.

In the context of counterfeit currency detection, CNNs can be trained to recognize specific features and patterns in genuine banknotes that can be used to distinguish them from counterfeit banknotes. These features may include security features such as watermarks, holograms, and unique patterns that are difficult to reproduce.

To train a CNN to detect counterfeit currency, you can use a dataset of real and counterfeit currency images. CNN uses this dataset to learn its ability to distinguish between genuine and counterfeit banknotes. Once trained, the CNN can be used to detect counterfeit banknotes by analysing banknote images and identifying deviations from the learned features.

CNN has been used in various research studies to detect counterfeit currency with promising results. However, it is important to note that the effectiveness of a CNN in detecting counterfeit currency depends on the quality of the dataset used for training and the robustness of the characteristics learned by the network.

### V. RESULTS

High accuracy rates have been found when utilising CNNs to detect fake Indian currency. Depending on the precise dataset used, the model architecture, and the hyperparameters selected, the accuracy rate can change.



Figure: Output of the currency with the statement.

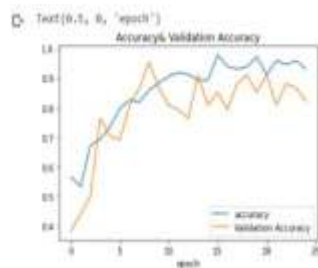


Figure: Graph of Accuracy vs Validation Accuracy.

The tabular form shows the precision, and accuracy values for the two classes of fake & real.

	precision	recall	f1-score	support
Fake	0.71	0.92	0.80	26
Real	0.94	0.76	0.84	42
accuracy			0.82	68
macro avg	0.82	0.84	0.82	68
weighted avg	0.85	0.82	0.83	68

Figure: properties of currency in tabular form.

## **VI. CONCLUSION**

Convolutional Neural Networks (CNNs) have demonstrated encouraging results in the detection of counterfeit Indian cash. CNNs are capable of accurately classifying money notes as authentic or phoney by automatically identifying key characteristics from photographs of the bills.

The process of detecting fake Indian currency using CNNs involves pre-processing the images, training the model on a large dataset of genuine and fake notes, and evaluating the model's performance on a test set. The accuracy of the model can be improved by using data augmentation techniques, fine-tuning the hyper parameters, and increasing the size of the dataset.

Banks, financial organisations, and law enforcement can employ CNNs as an effective tool for detecting Fake Indian currency.

## **VII. REFERENCES**

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