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Fake Currency Detection using Image Processing Done

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ABSTRACT: Fake Indian Currency Note (FICN) is a term used by officials and media to refer to counterfeit currency notes circulated in the Indian economy. However several central and state agencies are working together and the Ministry of Home Affairs has constituted the Fake Indian Currency Notes Coordination Centre (FCORD) to curb this menace. We propose a new approach to detect fake Indian notes using mobile camera and Image processing. We will convert Indian currency into more than 150+ different currency values to help tourists all over the world.In this project we match features between two images using Brute-Force Matching with ORB Descriptors. After applying BF Matcher with ORB we get Matcher Object and by using knn match we get the list of best k matches depending upon the value of k

- *Project Goal -* The goal of this project is to propose a convenient and cheapest method for identifying whether the currency note is fake or real and it's equivalent currency value into more than 150 countries. We are using a Convolutional Neural Network model. Our experimental results demonstrate with 99.44% of training and 93.48% of validation accuracy.

I. INTRODUCTION

Currency duplication also known as counterfeit currency is a vulnerable threat to the economy. Although fake currency is being printed with precision, the Crime Investigation Department (CID) says that they can be detected with some effort. Currency printed by local racketeers can be detected easily as they use the photographic method, hand engraved blocks, lithographic processes and computer color scanning.

In counterfeit notes, the watermark is made by using opaque ink, painting with white solution, stamping with a dye engraved with the picture of Mahatma Gandhi. Tourists are the most vulnerable people to fake currencies, because they don't know the proper and precise way of finding the difference between fake and real currencies. So automatic identification of currencies using image processing techniques will be helpful to these peoples. It is also useful at other workplaces.

The system is designed to check the Indian currency note with denominations 10, 20, 50, 100, 200, 500 and 2000. It will pre-process the digital pictures and organise the prepared arrangement of information and it will distinguish in monetary forms. This paper proposes a convenient and cheapest method for identifying Indian currencies. At the end of the process the user can know whether the currency note is fake or real and it's equivalent currency value into more than 150 countries.

II. EXISTING SYSTEM

This system is divided into four major parts, first is image scanning using a cellular phone, and second is the flask app which is a web application and an interface between user and imaging processing model. Then after image registration the image is fed into the image processing model as an input image. At the end Indian currency is converted into more than 150+ countries equivalent value. Automatic machines which can detect banknotes are now widely used in dispensers of modern products like candies, soft drinks bottles to bus or railway tickets.

The technology of currency recognition basically aims for identifying and extracting visible and invisible features of currency notes. Until now, many techniques have been proposed to identify the currency note. But the best way is to use the visible features of the note. For example, color and size. But this way is not helpful if the note is dirty or torn. If a note is dirty, its color characteristics change widely. So it is important that we extract the features of the image of the currency note and apply proper algorithms to improve accuracy to recognize the note.

III. PROPOSED SYSTEM

In counterfeit notes, the watermark is made by using opaque ink, painting with white solution, stamping with a dye engraved with the picture of Mahatma Gandhi. Tourists are the most vulnerable people to fake currencies, because they don't know the proper and precise way of finding the difference between fake and real currencies. So automatic identification of currencies using image processing techniques will be helpful to these peoples. It is also useful at other workplaces.

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IV. METHODOLOGY

The following are the steps followed for the prediction of FKD.
Scanning image:
● Input image is captured using a mobile camera of any other camera in the presence of sufficient light.
**Image registration:**
● Image registration is the process of aligning two or more images of the same scene. This process involves designating one image as the reference image, also called the fixed image, and applying geometric transformations or local displacements to the other images so that they align with the reference.
● Images can be misaligned for a variety of reasons. Commonly, images are captured under variable conditions that can change the camera perspective or the content of the scene. Misalignment can also result from lens and sensor distortions or differences between capture devices.
● Image registration is often used as a preliminary step in other image processing applications.

Classification of currency note:
● Discrete moving ridge remodel is applied on every currency note. The approximate constant matrix of the reworked image springs. Next, a collection of applied math options like mean, customary deviation; asymmetry and kurtosis are extracted from the approximate constant matrix.
● The extracted options are generally acclimated for recognition, allocation, and retrieval of bill notes. Here we tend to use a corruption abutment agent apparatus to allocate the pictures.
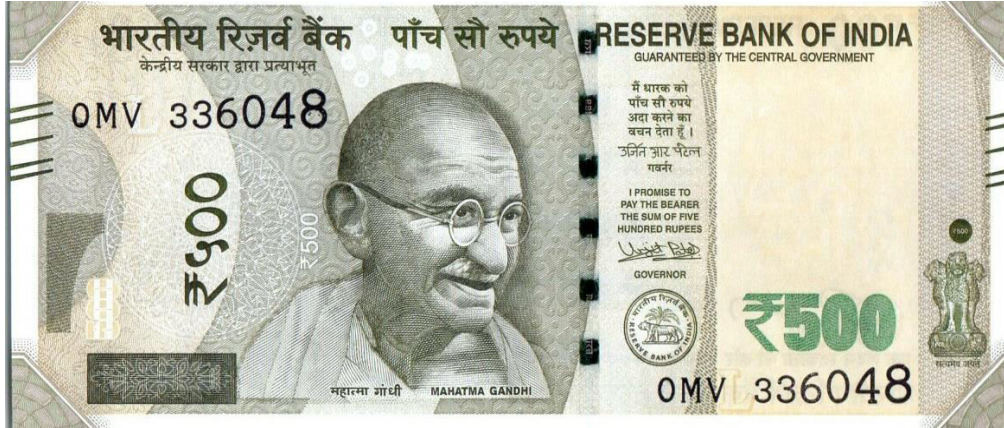
V. ARCHITECTURE
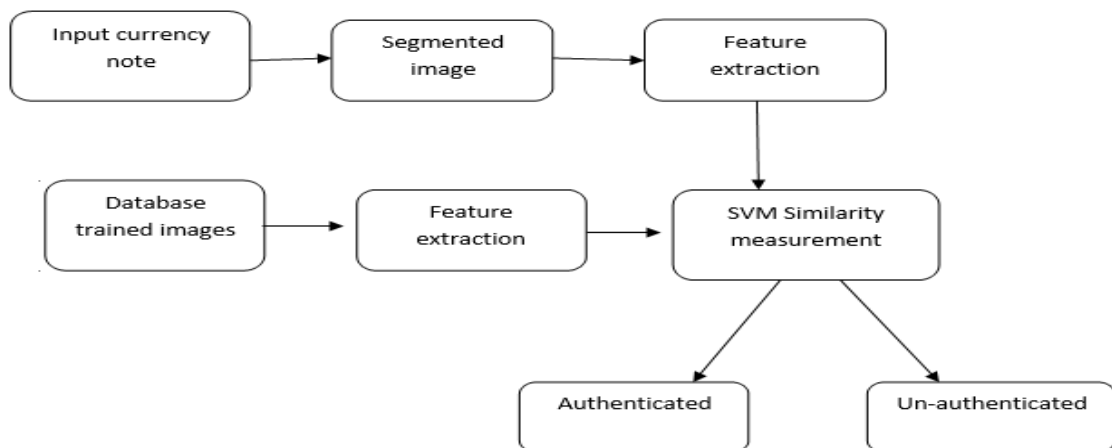
RESULTS:
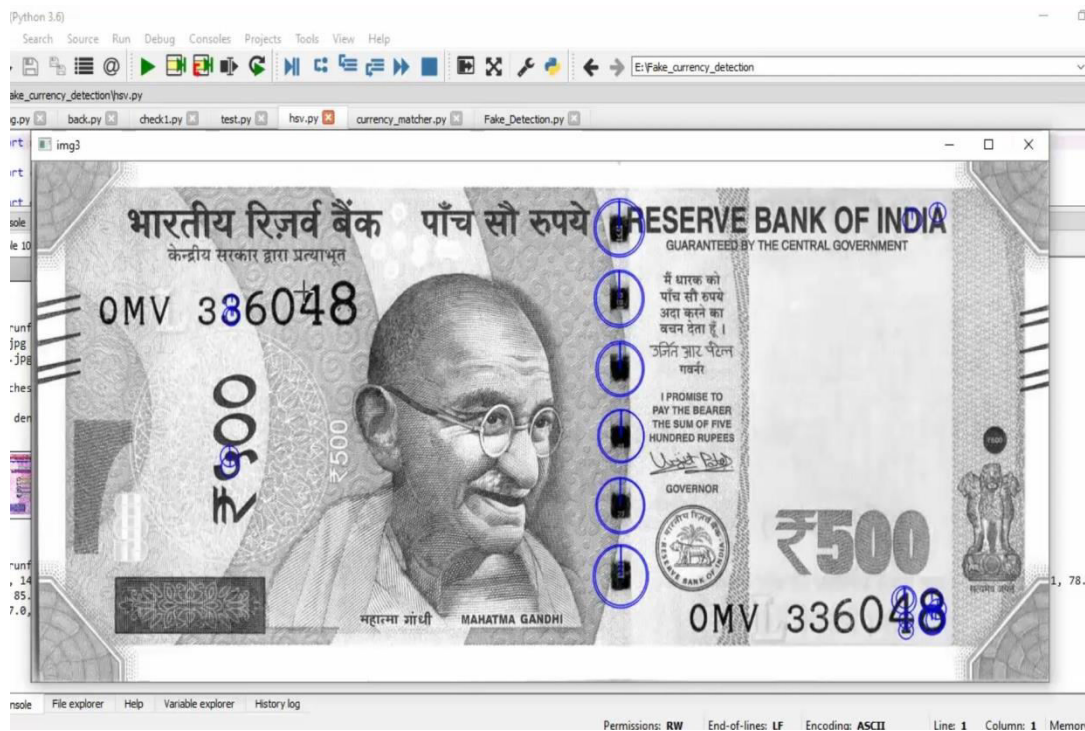

FIG 1. Currency note taken as input.

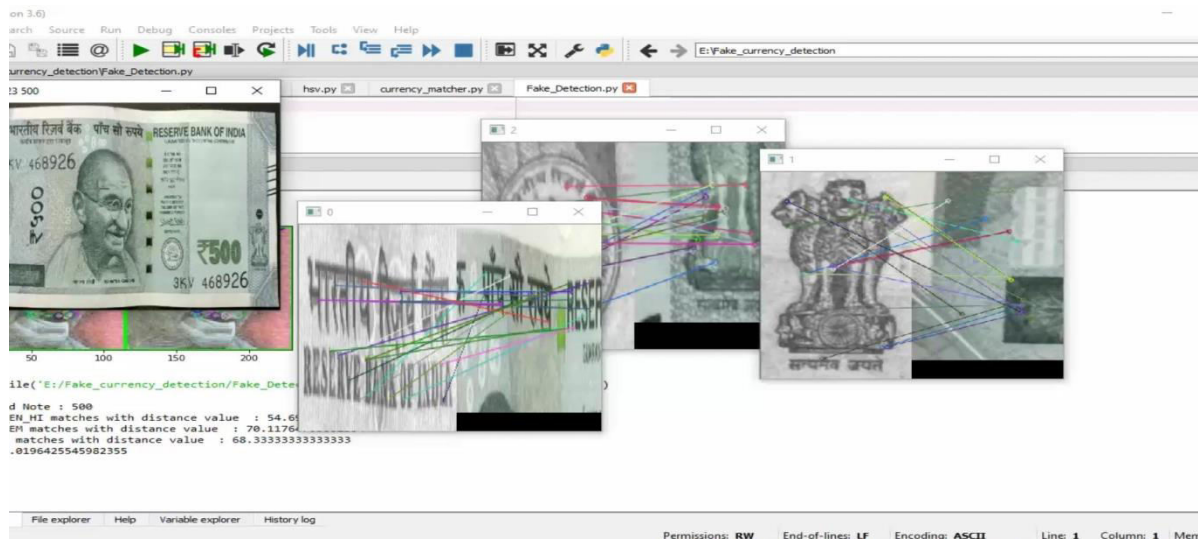*FIG 2. Currency features are extracted*

FIG 3. Determining that the currency is fake or real

VI. CONCLUSION AND FUTURE SCOPE

The fake currency detection using image processing was implemented in Python. Features of currency notes like serial number, security thread, Identification mark, were extracted. The process starts from image acquisition to calculation of intensity of each extracted feature. The system is capable of extracting features even if the note has scribbles on it.The algorithm processed here works suitably for the newly introduced 500 and 2000 denomination.. Hardware implementation of the proposed system can also be done using a suitable processor so as to increase the speed of detection.

The above results it was observed clearly that an original currency note's extracted features displays minimum intensity of 70%, it is seen that the 500-2 note displays intensity less than 75% for some features hence it is considered as fake note. At the end of this process users can now make the difference between the real and a fake currency note and can get the equivalent value in different currencies.

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