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FAKE CURRENCY DETECTION USING IMAGE PROCESSING.

[1]S. T. Saravanan , [2]N. Siri Varshini , [3]A.Sai Ram Prasad , [4]B.Sai Vishwa

[1]Assistant professor,[234]B.Tech Students Sphoorthy Engineering College, Hyderabad
[1]saravanan@sphoorthyengg.ac.in,[2]varsha3148@gmail.com,[3]sairamadimalla2003@gmail.com,
[4]saivishwabalasani143@gmail.com

ABSTRACT

One of the biggest problems that countries, including India, have is the identification of fake money. Even while automated systems are in place at banks and other large organizations to distinguish between real money counterfeit, it can be difficult for the average person to tell the difference. Money fraud is the second-oldest profession in the world, having existed for as long as money itself. A lot in historical times. This has caused a rise in corruption in our nation, impeding its ability to thrive economically.

Keywords:- picture capture , binarization , counterfeit goods , phony money , and security thread

I. INTRODUCTION

The Reserve Bank of India is the only bank in India with complete printing authority for banknotes. On the other hand, some people fake money. According to a report, there are currently 400 billion rupees worth of fake currency in circulation. Only 0.63 million, or seven out of every million, of the 90.26 billion Indian bank notes in circulation in 2015–16 were found to be counterfeit, according to information from the RBI These counterfeit notes were worth Rs 29.64 crore out of the Rs 16.41 lakh crore in circulation in 2015–16. Fake Indian currency, which is brought into the system in amounts of Rs. 100, Rs. 500, and Rs. 2000, is too difficult for the typical person to handle. These currencies victimize the average person. Manually testing each note is inefficient, and it is difficult to discern genuine currency from counterfeit. Therefore, automated processes are needed for bank note recognition. The currency picture needs to be sufficiently abstracted for monetary properties in order for the automated system to be accurate and dependable. When machines are utilized, either alone or in conjunction with human professionals, note recognition becomes simpler and more efficient. In this project, we created an extraction feature that uses image processing techniques such as space pictures, Thresh, and HSV color to recognize fake money notes using Python.

II LITERATURE SURVEY

[1] The paper "Fake money detection using web framework and basic Python programming" was presented in 2020 by Prof. Chetan More, Monu Kumar, Rupesh Chandra, and Raushan Singh. The solution that this study proposes is written in Python and makes use of the Flask web framework, which is a micro web framework that combines Python with web development.

[2] The 2019 paper "Detection of Counterfeit Indian Currency Note Using Image Processing," written by Vivek Sharan and Amandeep Kaur, describes how image processing may be used to recognize fake Indian currency notes. This study considered three main components: the latent image, the RBI logo, and the currency note's denomination number featuring the rupee symbol and color section. These three characteristics are used by an algorithm they've created to identify counterfeit Indian rupee notes.

[3] In 2019, Aakash S. Patil presented his work on "Indian Paper currency detection," which proposed a new technique to improve recognition and transaction speed for classifying Indian currency. It needed to make use of the OpenCv library of computer functions, which encompassed tasks including segmentation, recognition, and note identification. It was mainly focused on real-time computer vision. In addition, the OpenCV bindings' command line inputs were parsed using argparse, and numerical operations were performed using the Python NumPy package.

[4] In order to minimize the need for human labor, the study "Identification of fake notes and denomination recognition," conducted in 2018 by Archana MR, Kalpitha C P, Prajwal S K, and Pratiksha N, recommended the identification of fake notes and denomination recognition. The majority of this system consists of the money recognition and conversion process.They employed a software interface that was compatible with numerous financial standards.

[5] The 2017 study "Fake currency detection using Image processing" by S. Atchaya, K. Harini, G. Kaviarasi, and B. Swathi described the Performance Matrix approach for the Fake money detection utilizing MATLAB image processing system. This Neural networks and model-based reasoning are the foundations of this approach.This paper outlines numerous methods, such as optically changing ink, fluorescence, and water marking, for identifying counterfeit currency.

[6] Ms. Monali Patil and Professors Jayant Adhikari and Rajesh Babu created a system that employs visual processing to discern between the features of a genuine note and a fraudulent note. To train their data model, they employed the K-means and SVM methods for grouping features.

[7] Mayadevi A. Gaikwad and Vaijinath V. Vasudev D. Patil Bhosle In their study article, they provided a method for distinguishing genuine money from fake by comparing visual features, such as the distance between Gandhiji's face and other notations. This approach could be useful for a system that processes data entirely through software.

[8] Shreya Sheety, Renuka Nagpure, and Trupti Ghotkar. The flowery motifs on the notes issued by the RBI are used in a mechanism they have developed to differentiate real notes from counterfeit ones.

[9] Neeru Rathee, Arun Kadian, Vijul Dalel, Rajat Sachdeva, Yatin Jaie, and They advise fusing image processing and supervised machine learning to increase this method's accuracy and identify the traits that distinguish a genuine note from a phony one.

10] Garima Srivastava, associate professor Vinod Shokeen and Akanksha Upadhya Research Scholar. They showed in their study that accuracy levels higher than 99% can be achieved by integrating logistic regression with image processing.

III PROJECT AIM AND OBJECTIVE

The point of the extend "Fake Cash Discovery utilizing Picture Preparing" is to create a vigorous framework able of distinguishing fake money notes through computerized picture examination. The essential objective is to utilize progressed picture preparing strategies to recognize veritable money notes from fake ones based on different visual highlights such as watermark, security strings, and micro-text. Furthermore, the venture looks for to actualize machine learning calculations to improve the precision of discovery by preparing the framework on a dataset of both honest to goodness and fake cash pictures. Eventually, the objective is to give a solid and productive arrangement to relieve the circulation of fake money, subsequently shielding monetary astuteness and open believe in financial transactions.

PROPOSED SYSTEM

The proposed system for fake currency detection utilizes image processing techniques to analyze digital images of currency notes. It employs algorithms to identify key security features present in genuine currency, such as watermarks, security threads, and micro-printing. Machine learning models are incorporated to distinguish between authentic and counterfeit notes based on learned patterns and characteristics. The system aims to provide real-time detection capabilities, enabling swift identification of fake currency in financial transactions. Additionally, it offers scalability and adaptability to handle various currency denominations and designs. Its ultimate goal is to contribute to the prevention of financial fraud and uphold the integrity of monetary systems.

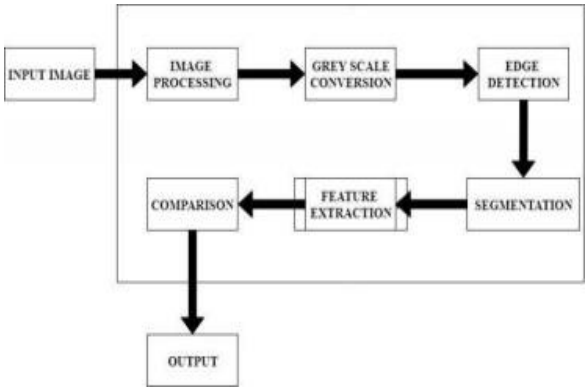
ADVANTAGES

- If the note is real or fake, the result will show it.
- This is the low-cost configuration.

SCOPE

The issue of fake currency has long existed and caused numerous issues for the market. Growing technological developments have made it possible to produce counterfeit money, which is then distributed in the market and weakens the nation's economy as a whole. Banks and other commercial venues have equipment to verify the legitimacy of the money. However, the average person does not have access to these systems, hence the demand for software that can identify counterfeit money emerges and is usable by the general public. The suggested approach makes use of image processing to determine if a cryptocurrency is real or fake. Python is the primary programming language used in the system's creation. It consists of procedures that are carried out with the appropriate techniques, including segmentation, edge detection, and grayscale conversion. Thanks to technological improvements, it is now possible to clone currencies so that they cannot be recognized ordinarily.

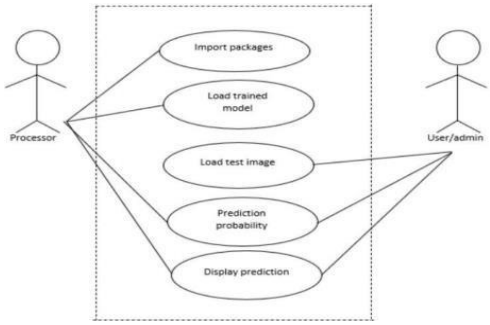
IV SYSTEM DESIGN SYSTEM ARCHITECTURE



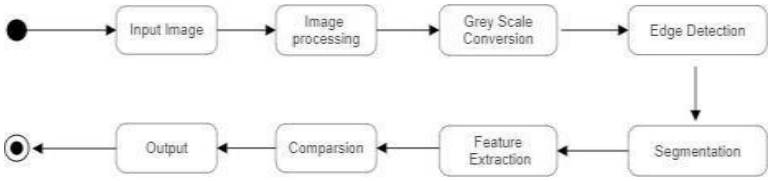
USE CASE DIAGRAM:

A system's dynamic behavior is shown in a use case diagram. It incorporates use cases, actors, and their interactions to encapsulate the functionality of the system. It simulates the duties, features, and capabilities needed by a system or a subsystem inside an application. It illustrates a system's high- level functionality and describes how a user interacts with it.

ACTIVITY DIAGRAM

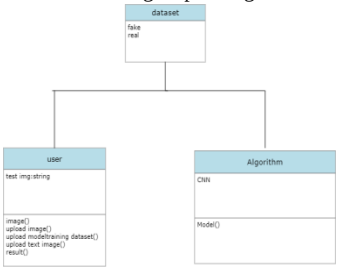


The activity diagram in UML shows how control moves across the system, emphasizing the order of operations over implementation specifics. It depicts both sequential and concurrent systemic activity



CLASS DIAGRAM:

Static diagrams are those used in classes. It is an image of an application's static view. Class diagrams are used to create executable code for software applications in addition to being utilized for visualizing, explaining, and documenting various system components.



FEATURE EXTRACTION

It is anticipated that the features set will extract the pertinent information from the input data if the retrieved features are correctly selected. For feature comparison, the system employs the SSIM (Structure Similarity Index Method) technique. The system is comparing the following features for the 2000 Rupee note:

1) Mahatma Gandhi's portrait in the center
2) BI Micro letters
3) A security thread with an RBI inscription
4) Governor 8's signature, the Guarantee Clause, the Promise Clause, and the RBI emblem to the right
5) National number with the rupee symbol at the bottom right
6) Right-hand Ashoka Pillar emblem and electrotype watermarks
7) A panel with numbers that are getting bigger on the top left and bottom right sides
8) The left and right angle bleed lines of the currency.
9) Year of currency printing on the left
10) Swacch Bharat logo with slogan

FUNCTIONAL REQUIREMENTS:-

IMAGE PREPROCESSING:-

An procedure where both the input and the output are intensity images at the lowest level of abstraction is commonly referred to as pre-processing. By suppressing unwanted distortions or enhancing certain visual properties that are crucial for additional processing, pre-processing aims to improve the image data. Noise reduction is carried out in this system during image pre- processing .This form of noise is eliminated, a la salt and pepper.

GREYSCALE CONVERSATION:-

In order to simplify the coding, the image is transformed into a grayscale version. A grayscale image can be created from an RGB image using a variety of techniques, including the desideration approach, the luminance method, and the averaging method. This step's input is the grayscale image.

EDGE DETECTION:-

Utilizing Canny Edge Detection offers significant advantaged over the techniques, particularly in its ability to efficiently extract pertinent structural information from diverse visual objects. This technique notably reduces the volume of data that necessitates processing, thereby enhancing the system's performance.

MODELING:

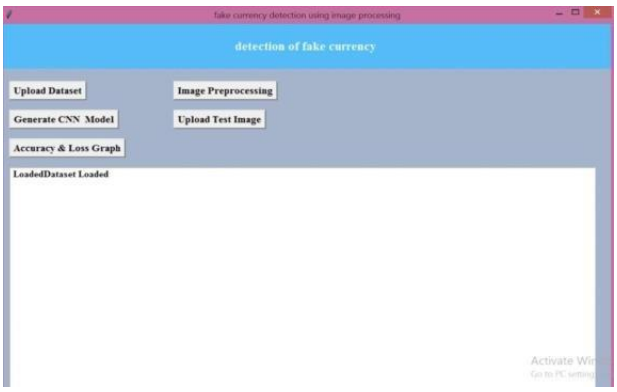
We have designed the following components in order to implement this project.

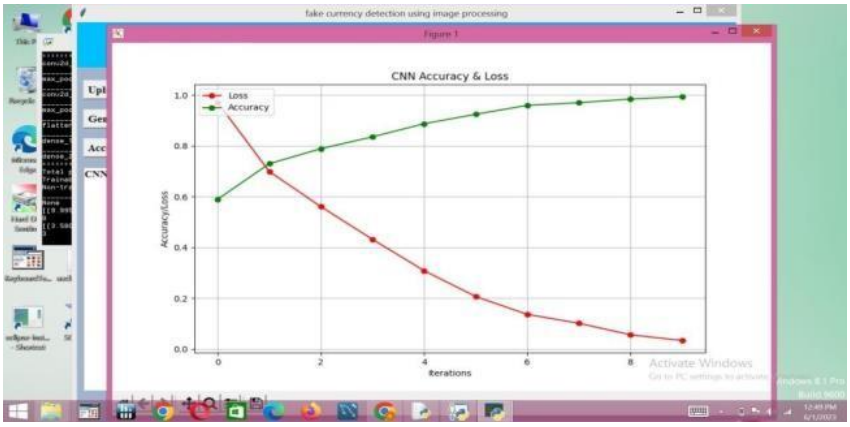
1) Upload Dataset: This module allows us to upload our dataset, which consists of both real and counterfeit banknotes.
2) Image Processing: With the help of this module, we can determine how many images are included in the dataset and enhance or amplify certain image characteristics that are crucial for further processing and analysis.
3) Create a CNN model: We obtain the CNN training model accuracy using this model.
4) Upload Test Image: We may upload a test image using this model to determine whether the money notes are real or false.
5) Accuracy and Loss Graph: This provides a CNN accuracy and loss graph of real and counterfeit banknotes.

TEST PLAN

The primary aim of the test plan for the proposed project is to outline the testing specifics of the group authentication scheme. This software project test plan delineates the goals, scope, and methodology for testing the software. It outlines the items and features slated for testing, the testing methodologies to be employed, as well as the necessary resources and schedule for completing the testing phase. Additionally, the plan addresses the potential risks associated with the testing process.

OUPUT DISPLAY:





V CONCLUSION:-

This project was driven mostly by the need to create a practical and effective solution. This system, which is built on Python, is able to automatically discern between real and counterfeit Indian cash. Experimental results show that this low-cost system quickly produces accurate and dependable results by using efficient and effective image processing techniques. 500 Indian rupees are accepted for the written Python code.

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