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Cashify- Indian Cash Detection

[1]Hasib Shaikh, [2]Shreyas Jadhav, [3]Tanmayi Indukuri, [4]Shrutika Ugale, [5]Prof. Nita Ingale

[1,2,3,4]UG Student. [5]Project Guide

[1,2,3,4,5]Information Technology, Vasantdada Patil Prathishtan College of Engineering, Mumbai, India

ABSTRACT-

In the run of our life, currency plays the most important part. Relating currency denotation is occasionally the most delicate thing people could find. Since we're living in the computer world, everything could be possible with the machine. Detecting an object from the image is getting the intriguing exploration in the recent times, which can be done by using different deep literacy ways. This is a frame for feting and relating the denotation of the currency depending on the trained currency images. We're using six appellations of the Indian currency which are captured in all exposures for testing and training datasets. For accurate birth of features, we're using Convolutional Neural Network model. One of the premier issues defying the visual hindered existent is plutocrat, acknowledgment especially for cash. Be that as it may, the outwardly weakened existent may not suppose about the estimation of cash, and they endure part in cash trade related issues in their normal life. To address this issue, we've erected up a frame for acknowledgment of plutocrat, notes, which might be the helpful device for an outwardly devitalized existent. disquisition and trials were done on the plutocrat instructional collection, which encouraged CNN dependent on the crucial highlights, for illustration, watermarks, film land published on cash, recognized composed as words and figures and the total cash. This design deals with the application of Convolutional Neural Networks (CNNs) for working this society issues and examinations about the exhibition and evaluation of different CNN mode.

1. INTRODUCTION

The World Health Organization estimated the number of visually crippled at the global position, predicated on the bottommost studies, that there are about 285 million people who suffer from visual impairment worldwide, of whom 246 million people have visual impairment and 39 million people are fully visionless. One of the main problems faced by people with visual disabilities is the incapacity to recognize the paper currencies due to the similarity of paper texture and size between the different orders. This Android operation presents a deep knowledge- predicated system for identification of nomenclatures of Indian Currency Rupee notes from their color images. An image dataset of four bill nomenclatures is prepared by preprocessing and addition of real- bank note images acquired in different shoes and lighting conditions via smartphone camera Also the problem faced by foreign rubberneck is that they might not understand Indian currency. To overcome this issue we have added currency motor option as well. Currency is an necessary part of our day- moment life. Despite the swiftly expanding operation of master cards and fresh electronic payment orders, capitalist is extensively employed for everyday exchanges because of its comfort. The current day fiscal tone- service gives birth to currency recognition, which plays a vital part in the automated banking procedure. Therefore we propose a new system for currency recognition that identifies Indian currency in different views on the scale. It's straightforward for a typical mortal being to comprehend and recognize any bill easily, but it's really worrisome for anyone with a visually crippled or visionless existent to negotiate a similar task. Bills generally have unique designs according to the denotation and can be sorted with fat mortal crimes in the bank. These crimes lead to difficulties in assessing and recognition. However, it will immensely boost the perfection of recognition and meliorate people's workload efficiently, If computers or mobile apps fete currency. As capitalist has a significant part in quotidian life for any business deals, real- time discovery and recognition of bills come necessary for a person, especially visionless or visually crippled, or for a system that sorts the data. The model which we worked on principally classifies the currency note into distinct nomenclatures like Rs10, Rs50, Rs100, Rs500 and Rs2000. The currency will be recognized and classified by using image processing ways, deep knowledge ways. We have executed transfer knowledge proposition, a deep knowledge sphere where we will exercise the weights in one or farther layers from a formerly trained model into a new model by either maintaining the weights fixed, fine- tuning them, or conforming the weights completely when training the model. We aim to enhance ways that have been missing in utmost contemporary factory that have been done so far. Therefore our proposed currency recognition system can be efficiently run on the web operation/ mobile app, where a user would upload an image of the currency note, and it will deliver an audio affair and a text affair.

1.1 OBJECTIVE

Main objective of our android operation is that:

➢ Identify the correct denotation of the currency grounded on different attributes.

➢ Development of Real Time Paper Currency Identification and Audio Output System using open source.

➢ To recognize the paper currency with the help of scanner or camera.

➢ For the visually challenged and excursionists, this operation will allow them to autonomously deal with Indian bills, particularly while accepting their plutocrat back during their day to day conditioning.

➢ To fete the fake and genuine currency note.

1.2. PROBLEM STATEMENT

The currency recognition ways that were enforced before were using some texture, or pattern or any other point to fete currency notes. The recognition technique discussed in this model does not require the image to have the exact size as that of the currency note for these we use the edge detector. In this Technique we give the folder of random notes that we have to detect, and as the result it displays amount of the scanned image.

2. LITERATURE SURVEY

The bracket of Indian currency notes has been addressed in several approaches. Over the years, a substantial number of researches have been executed in this field of currency note recognition. The authors have accomplished recognition based on color, texture, security features. The generally utilized methods incorporate artificial neural networks, currency characteristic comparison, principal component analysis, local feature descriptors comparison, hidden Markov models, and Naive Bayes classifier. A paper currency recognition system is developed to collect conspicuous or retired currency features for classification. Lately, various techniques were engaged in recognizing paper currencies. Hassan pour introduced a reasonable system to prize visible features from the currency. still, such a procedure ceases to serve when dealing with similar sized currencies of different countries or currencies whose visible features are damaged. Prevailing exploration in the area of currency recognition is established on the image processing and neural networks. Vila et designed a currency recognition system using a symmetric mask for the paper currency signs. In this process sum of all non-masked pixel values are computed and provided as input to the neural network. Zangh proposed detection based on pattern edges of the currency. In this system, the paper currency is vertically divided into several corridor, and the system will discover the number of pixels denoting each edge. The pixel value achieved is later provided to the backpropagation neural network. There are many methods inferred to detect faces using neural networks. For instance Vaillant et al. searched for regions that may contain a face in the input image using a neural network and used another neural network to deduce if it indeed contained a face. Also, Roley et al. proposed to detect faces using a neural network learned using the Bootstrap method, achieving high performance in detecting frontal faces. This method was later expanded so that it is robust to the rotation of the face. In 2002 Garcia et al. presented a neural network that can detect faces in input images of different sizes, various lighting conditions, and varying faces' orientation. Further, in 2005 Osadchy et al. achieved real-time face detection and pose estimation using a Convolution Neural Network (CNN). Not only have neural networks shown their outstanding performance in face detection, but they have exemplified usefulness in detecting objects other than faces. Moreover, in recent years, training deep neural networks have become feasible, steering to detect multiple concurrent objects. Thus, we conclude that adopting transfer learning techniques, which is a deep learning domain, helps to train a pre-trained model and recognize images for adequate accuracy.

3. PROPOSED SYSTEM

The proposed system of this article is divided into two parts such as:

1) Currency Recognition   2) Currency Verification

A point akin to an identity mark and an optic variable link are employed in currency recognition. Each point's pixel value is computed. Its pixel value histogram is based on collusion. For recognition, a currency point comparable to an ID mark and an optical variable link will be used. For cash verification, elements including watermarks, security threads, luminescence, and idle images will be used. The flowchart for currency recognition is shown in the figure below. Characters from each separated component are uprooted in the currency verification process. You can calculate the pixel value for that uprooted area.

1. Image Acquisition: The initial step in any workflow sequence for image processing is always picture acquisition because processing is impossible without an image. After the image has been created, it can be processed using colourful techniques to carry out the many distinct visual jobs. There are vibrant ways to obtain images that are comparable to using a camera or scanner. All the features should remain in the acquired image.

2. Pre-processing: The major goals of pre-processing are to improve the manipulation of data sets and the visual appeal of images. The technique of correcting distortion, declination, and noise introduced during the imaging process is known as image pre-processing, or picture restoration. The method largely employed for operations like zooming, rotating, and shrinking as well as for geometric corrections is interpolation.

3. Binarization: The RGB-colored image that was captured. Because it just carries the intensity information, which is simple to reuse, rather than recycling three components, R (Red), G (Green), and B, it is changed into argentine scale (Blue). to combine the RGB data for each pixel to get a single value that represents the brightness of that pixel.4. Edge Discovery: Edge discovery refers to a group of fine techniques that are used to identify the locations in a digital image where the brightness of the image sharply varies or, more formally, where these durations exist. The locations where an image's brightness sharply fluctuates are typically grouped into a set of twisted line segments called edges. Edge finding is a technique used in image processing to explore object boundaries. It operates by looking for breaks in brilliance.

5. Image Segmentation: The goal of segmentation is to make an image's representation more straightforward, meaningful, and/or simple to analyse. Typically, picture segmentation is used to identify objects and image boundaries (such as lines, angles, etc.). The two initial packets of picture intensity data serve as the foundation for most image segmentation algorithms.

1) Inconsistency based on sharp fluctuations in intensity that resemble the borders of a picture.

2) Similarity Grounded on partitioning an image into regions that are analogous according to a set of predefined criteria.

6. Feature Extraction: A particular kind of dimensional reduction, feature extraction. When an algorithm's input data is too big to reuse and is thought to be genuinely sparse, it will also be reduced to a smaller collection of features for representation. Point birth is the process of turning the input data into a collection of features. In order to complete the requested task using this condensed representation rather of the full size input, it is expected that the features set will carefully select the relevant information from the input data.
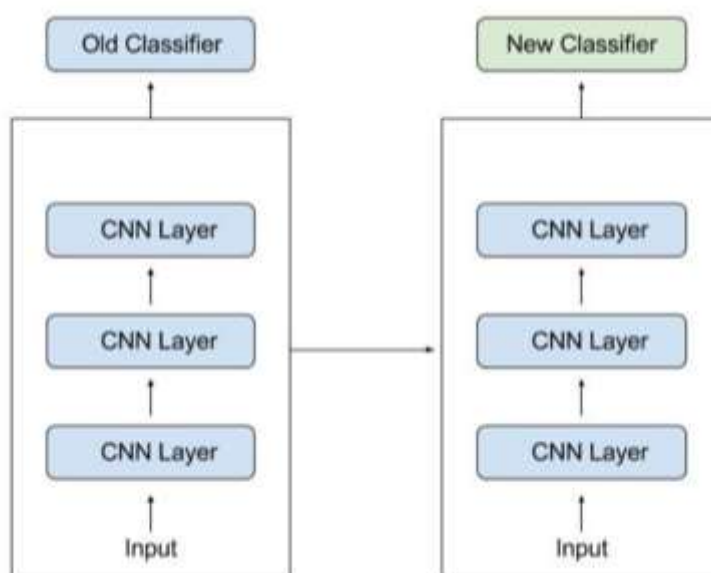
Currency Recognition Flow:
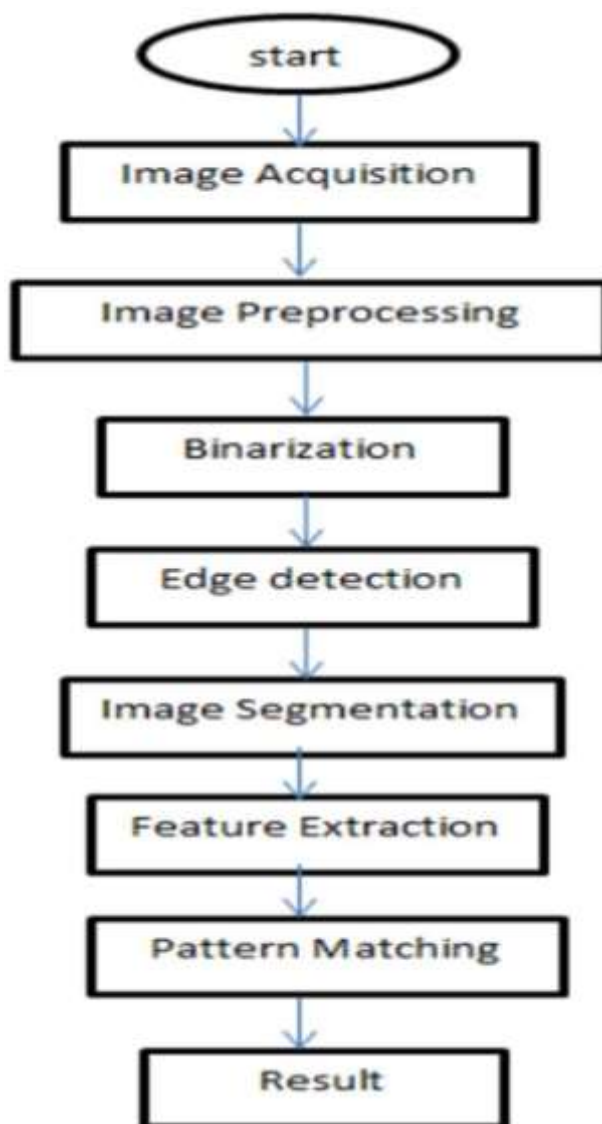
4. IMPLEMENTATION

Software / Hardware Requirement:

• Android: Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touchscreen mobile devices such as smartphones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance and commercially sponsored by Google.

• Python: Machine Learning (ML) is basically that field of computer science with the help of which computer systems can provide sense to data in much the same way as human beings do. In simple words, ML is a type of artificial intelligence that extracts patterns out of raw data by using an algorithm or method. The key focus of ML is to allow computer systems to learn from experience without being explicitly programmed or human intervention.

• TensorFlow: TensorFlow is a free and open-source software library for machine learning and artificial intelligence. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks

• Java: Java is a popular programming language. Java is used to develop mobile apps, web apps, desktop apps, games and much more

ML Algorithm: Transfer literacy Transfer literacy in general refers to machine literacy approaches where knowledge gained in one task is reused to ameliorate the literacy of an affiliated task. The reasons for using transfer literacy are grounded on the fact that the successful operation of a deep neural network depends on a tremendous quantum of training or pre-training data. Similar data are occasionally precious or delicate to gain, similar as in the case of FCISs. Numerous exemplifications have shown that transfer literacy can be salutary for problems where training and testing data are in different point spaces or data distributions. Transfer literacy can be astronomically distributed into inductive transfer literacy, unsupervised transfer literacy, and transductive transfer literacy. Each order contains colourful sub-approaches. The approaches most nearly related to our work in computer vision are transfer literacy styles with a pre-trained model/ ConvNet (Convolutional Network). A pre-trained model is generally trained on large standard image datasets, similar as the ImageNet, which contains rich point representations from a low position to a high position. These point representations can be incompletely or entirely reused in other tasks simply by integrating the actuated conv. layers in a new deep neural network as a point extractor and also fine- tuning the layers of the pre-trained model via nonstop backpropagation. Numerous operations have shown that state of the art object sensors can be erected via this approach.

Transfer Learning Algorithm

5. CONCLUSION

The application uses Transfer Learning algorithm for the purpose of Recognition and Verification of the Indian currency.

This program helps an average Indian citizen to recognize the value of the note and the authenticity of the note with utmost ease.

The Voice announcement feature which makes a sound of the result helps the visually impaired and also the tourists that cannot recognize the Indian Currency.

We have used a normal mobile phone camera in our program which will make sure people don't have to spend a single penny for using this system.

This application can run on any android devices as there is no need of higher configuration devices.

6. REFERENCE

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