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Currency Recognition System Using Image Processing

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Abstract: *It is terribly tough to count totally different denomination notes during a bunch. This paper propose a image process technique to extract currency denomination. The extracted ROI are often used along Pattern Recognition technique. Initial we accumulate the image by easy flat scanner on fix dpi with a selected size, the pixels level is getting ready to get image. Some filters square measure applied to extract denomination worth of note. we tend to use totally different picture element levels in several denomination notes. The Pattern Recognition technique is employed to match or realize currency value/denomination of currency value/denomination of currency.*

Keywords: *Computer vision, currency recognition, fake currency, feature extraction and description, image processing, SIFT algorithm,*

I. Introduction

According to the survey conducted by the CIA, there are 180+ currencies presently circulating in the world. Each of these currencies differs greatly in features such as size, color and texture. Unlike the olden times, the trade and commerce between countries has increased in all sorts of levels. The need for acquiring knowledge about all the currencies by the banks has been extremely important. However for any human teller to recognize each note correctly is something that is not feasible. Thus it's important to grow machine-controlled system to urge feature and acknowledge Indian currency note in varied space like banking atm machine shopping mall, Bus station and railway station. This procedure would presumptively begin with image handling strategies, for instance removal of the noise, emulated by (low-level) characteristic extraction to put lines, and bound texture contains the feel and therefore the bound boundaries. One rationalization behind this is often be} associate AI issue that associate item can appear altogether totally different once seen from distinctive points or Below dissimilar lighting associate alternate issue is of selecting what options slot in with what item and that area unit foundations or shadows then on The human visual framework performs these undertakings inadvertently.

II. Literature Survey

The survey has planned by Jainist [1] a picture process methodology to extract paper money amount. initial they get the image by straightforward flat scanner on glue dpi with AN exacting size, the pixels level is place to realize image. a number of filters square measure helpful to extract denomination assessment of note. They use dissimilar component levels in several amount notes. The paper was conferred by Mirza and Nanda [2] a way for confirming paper money of Republic of India. The technique detects four characteristics of currency namely identification mark, latent image watermark and security thread, the theme might extract the hidden options i.e. watermark and latent image of the currency. The Anticipated work is an approach to extract characteristic of Indian currency.

Review

The review was conferred for classification of currency denomination by Chakraborty et al. A number of techniques applied by a diversity of researchers are proposed briefly in organize to evaluate the condition of art. The writer is focusing mainly on currency recognition system involving various methods like image pre processing, feature extraction and categorization using various algorithm.

Analysis

The paper was incontestable by Reel et al. [4] of analysis of characteristics and different serial numbers of Indian notes for detection of currency. To differentiate between the currency notes, there is a need of extracting features of the images. The standard of complete OCR method is affected by nursing extraction

technique, it's extremely important to extract features which can be steady in various conditions, distortion of image causes deformation of characters. this analysis of characteristics is completely for the reason to get the exact options of characters before feature extraction in currency recognition. The survey was made by Pawade et al.on preexisting techniques of currency recognition on image processing. They have discussed both invent recognition and paper currency recognition techniques separately. Finally they summarized their work in tabular form which is very cooperative for study at a glance. Even though there is lot of research work done on this topic, still there are a number of issues related to the accuracy and efficiency of the method. Hence getting the maximum efficiency and achieving 100% accuracy for diverse currency, when the currency is not in a good state, will always go against for researchers. The review was published by Ali and Manzoor on image processing for recognition of currency. The suggested system checks different features of the currency for recognition. Their experiment shows that there is the squat cost machine for recognizing the Pakistani currency. They had checked various notes on this system and the result is 100% which means that the system is working competently. The paper was published by Krishan on advancement of extracting features of Indian paper notes. The suggested approach begins with scanning of the document and converting it into binary image then thresholding and word segmentation and morphological filtering is done successfully. One of the issue in the characteristic segmentation is that dual characters are merged together. The review was published by Nayak and Danti in which an important feature is extracted from the currency and recognized. various Currency features like year of print , values etc. are divided for detection using 3×3 matrix. Stands on geometrical shape, quantity of currency such as 100, 500, 1000 are determined with the help of Neural Network classifier. using OCR techniques, the extraction of year of publish from the currency note is done. given method is checked on a large database and it demonstrates the accuracy of the method.

III. Block Diagram And Description

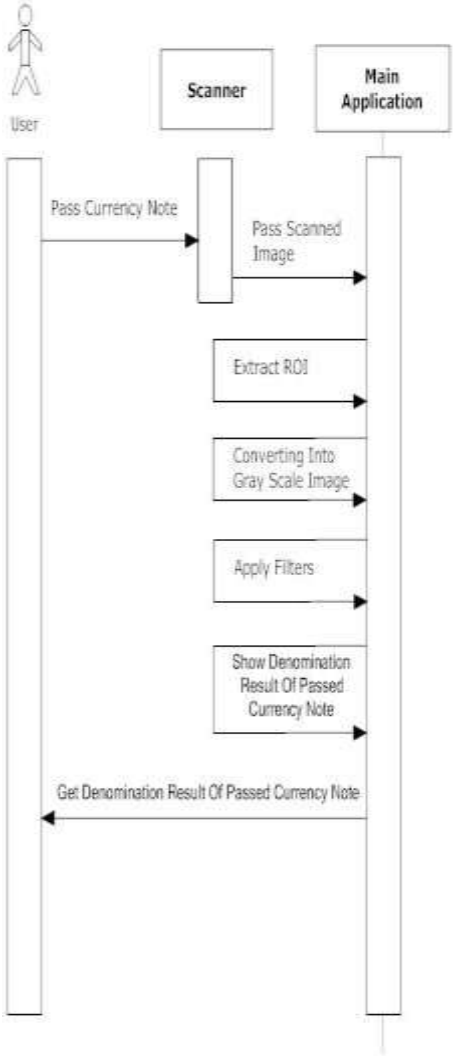

Fig.1

There are various technique for currency detection that includes pattern, texture or color based. techniques of image processing are used to find ROI , after that SIFT algorithm is used for pattern matching. The methods are as follows -

1. Different denomination notes are scanned.
2. ROI is extracted.
3. Converting image in Gray scale, LUV, ycbcr.
4. Denomination value can be obtained by Median Filter.
5. For edge detection, we use canny edge detection and taking histograms of the image.
6. After getting numeric values, it is compared by using Pattern detection Tool in MATLAB

The design flow of currency recognition system has eight steps. This structure works on two of the images, one of the image is original and other image is of currency used for verification purpose.

3.1 Image acquisition: a scanner or a camera is used for getting the image. all the features should be visible in the image.

3.2 Pre-processing: In pre-processing the main operation is analyzing of data and extracting information. for further processing, few features of image are enhanced and undesired distortions are put down. this includes image adjusting and image smoothening. In image adjusting, when image obtained from scanner the size of image is large therefore to reduce the size of image, image adjusting is used. In this for image adjusting interpolation is used. little noise will be visible on the image during image smoothening.

3.3 RGB conversion: The image obtained is in RGB color. It is transformed into gray scale because it takes only the intensity information which is easy to process than processing of three component RGB.

3.4 Edge detection: The edge detection is a basic tool in image processing, image analysis, image pattern recognition and computer vision techniques. Edge detection is basic tool particularly in the area of feature detection and feature extraction.

3.5 Image segmentation: In image segmentation, the image is divided into regions or objects depending on problem the segmentation is done. Segmentation algorithm for monochrome image are based on two basic properties of image intensity.

3.6 Feature extraction: Feature extraction is the specific form of dimensionality reduction. It is the method of capturing the visual content of image for retrieval and indexing. When input to the indexing algorithm is too large to be proceeding and it is having much data but not more information. Then input data will be converted into reduced representation set of features. Feature extraction makes simple resources required to describe the large set of data.

3.7 Comparison: In comparison, the extracted feature of input image and extracted feature of original image is compared.

3.8 Output: The output is displayed on LCD display. The output is currency denomination or currency is fake or original.

IV. Conclusion

This recognition method of Indian paper currency is quite simple, efficient and easy to be realized because denomination numerals are used for identification which can be extracted easily from paper currency. Such numerals are matched and are found exact match for identification. This method of currency recognition will certainly help to identify different denomination of paper currency. This method can be used for counting of different denomination note bunch.

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