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CURRENCY RECOGNITION SYSTEM USING IMAGE PROCESSING

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ABSTRACT:

We presented a digital image processing-based system for automated cash recognition in this article. Recognising cash by its picture or photograph is the primary goal of the following project. Currency data such as value in INR, EUR, and USD, as well as the name of the currency, will be easier for consumers to recognise. It relies on the primary features of currency notes, such as their size,

colour, and printed text, and it also takes into account variations in currency notes within the same nation. We have taken into account the denominations of the two most common currencies in our sector, the INDIAN Rupee and the US Dollar. Not only does this technology reliably recognise the money notes, it does so swiftly.

Keywords: *Password, graphical, high security.*

I. INTRODUCTION:

According to the UN charter there are around 195 countries around the globe. In which 193 countries are members of the UN and two are observing states.

According to The U.N., worldwide there are 180 currencies. All these currencies

are different in characteristics such as size, colour and texture. In the era of rapidly growing levels of trade between countries and also tourism all over the world, it becomes necessary to recognize each currency note correctly. Now a days people travel to different countries, they use their native country currency in

paying bills or buying stuffs and because most of the local people are not familiar with the currency other than their own country currency and also not familiar with the exchange rate of that currency in their own currency, it becomes necessary to develop an automated system that helps in recognition notes easily, faster with efficiency.

The proposed system is based on image processing and makes the process robust and automatic.

We used INR and USD as an example to illustrate the technique. This system is based on our knowledge about computer science technologies like Digital Image Processing, python and also a small step to implement in a system that is most important for industrial development.

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The block diagram as in Fig. 1 shows the used methods in the system to obtain the actual output same as the expected output. First of all input a currency note image, which needs to be checked. Then system performs basic image processing techniques on input image and refined to convert it into a usable input for matching with present image in dataset. The system extracts the information from image based on features such as colour and texture. With the help of these features the system determines currency name and denomination of the currency note. After this the exchange rate of currency will be extracted from internet with the help of online exchange rate api url. At the end output displayed on the screen.

II.LITERATURE SURVEY:

Digital Image Processing, 4th Edition

The 4th Edition, which celebrates the book's 40th anniversary, is based on an

extensive survey of faculty, students, and independent readers in 150 institutions from 30 countries. Their feedback led to expanded or new coverage of topics such as deep learning and deep neural networks, including convolutional neural nets, the scale-invariant feature transform (SIFT), maximally-stable extremal regions (MSERs), graph cuts, k-means clustering and superpixels, active contours (snakes and level sets), and exact histogram matching. Major

improvements were made in reorganizing the material on image transforms into a more cohesive presentation, and in the discussion of spatial kernels and spatial filtering. Major revisions and additions were made to examples and homework exercises throughout the book. For the first time, we added MATLAB projects at the end of every chapter, and compiled support packages for students and faculty containing, solutions, image databases, and sample code.

Identification of Paper Currency Techniques: A Survey

Paper currency identification is an image processing technique i.e. worn to recognize currency of different countries. The paper currencies of different countries are possibly interweaved collectively consequently rises ever more. It is a challenge for standard currency recognition systems. However, the main focus of most of the standard currency recognition systems and machines is on recognizing forged currencies. Hence there is very vital role of currency identification system and it is essential that the identification system should be very accurate. A thriving approach for paper currency identification depends upon preprocessing, feature extraction and classification of that currency image. In this paper, we have gone through different literature which describes different techniques of paper currency recognition. Finally we have concluded that if we apply some efficient pre-processing and

feature extraction technique than we can improve the accuracy of identification system.

Recognition system for real time paper currency

Money number recognition refers to the money of the currency, the currency and authenticity recognition. Money number recognition system is the kernel module of self-service system, and the major applied range is cash-related equipments. In this paper we design a kind of money number recognition system. The quick positioning of money number is achieved based on gray value accumulation. The edge line of money number area is detected using the least square method. Using geometrical rotation method and gray adjacent interpolation method to realize the number of tilt correction. Based on the character structure characteristic and the imaginary line and character of the point of intersection features, formation recognition judgment tree, realized the character recognition. The simulation

experiment indicates that this algorithm has a high recognition accuracy under the condition of rejection.

Extraction of serial number on bank notes

The study of RMB (renminbi bank note, the paper currency used in China) serial number recognition draws more and more attention in recent years, for reducing financial crime, improving financial market stability and social security. The accuracy of RMB recognition relies heavily on the extraction, which is a challenging problem due to background variations and uneven illumination. In this paper, we present a new system that extracts the RMB characters directly from scanned RMB images. First, two different techniques, namely skew correction and orientation identification are used to detect the region which contains RMB serial number. Then the detected text region is binarized by a combined thresholding technique. After that, a local contrast average method is introduced to

extract the RMB characters from the binarization result. The experiments demonstrate that the proposed binarization method outperforms other well-known methods. For character extraction, we report an overlap-recall rate of 79.68% and an overlap-precision rate of 98.10% respectively.

III. EXCITING SYSTEM:

According to the UN charter there are around 195 countries around the globe. In which 193 countries are members of the UN and two are observing states. According to The U.N., worldwide there are 180 currencies. All these currencies are different in characteristics such as size, colour and texture. In the era of rapidly growing levels of trade between countries and also tourism all over the world, it becomes necessary to recognize each currency note correctly. Now a days people travel to different countries, they use their native country currency in paying bills or buying stuffs and because most of the local people are not familiar

with the currency other than their own country currency and also not familiar with the exchange rate of that currency in their own currency, it becomes necessary to develop an automated system that helps in recognition notes easily, faster with efficiency.

IV. PROPOSED SYSTEM:

The proposed system is based on image processing and makes the process robust and automatic.

We used INR and USD as an example to illustrate the technique. This system is based on our knowledge about computer science technologies like Digital Image Processing, python and also a small step to implement in a system that is most important for industrial development. We had considered INDIAN Rupee and US Dollar for this project. Project can expand for more currencies inclusion according to use.

CNN Algorithm

1) Feature Extraction: CNN compose of multiple layers and first layer define for feature extraction and this features will be extracted from given input image dataset or any other multidimensional dataset.

2) Feature Selection: Using this layer features will be selected by applying a layer called pooling or max polling.

3) Activation module: using this module RELU will be applied on input features to remove out unimportant features and hold only relevant important features

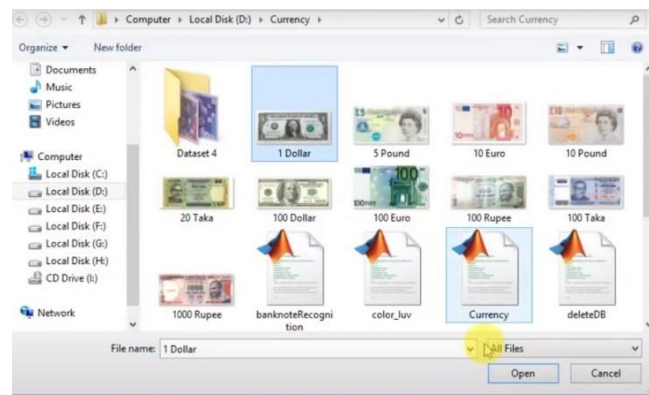
4) Flatten: This layer will be define to convert multidimensional input features into single dimensional input array

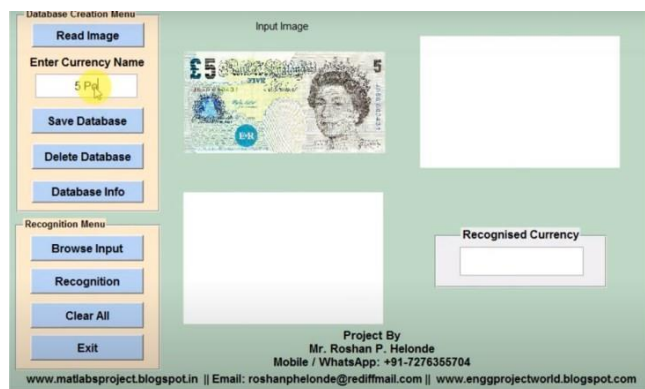
5) Dense: This layer can be used to connect one layer to other layer to receive input features from previous layer to new layer to further filter input features in next layer to get most important features from dataset to have best prediction result.

V.METHODOLOGY

The proposed system was implemented using Visual Basic .net 2005 (VB.net). The implementation has three main classes:

- Login Info: Contains username, graphical password, and related methods.
- Graphical Password: Contains graphical password information and related methods.
- Sel Reg: Contains fields about selected regions (POIs).





VI. CONCLUSION

Finally, we have developed a method that can positively identify a banknote's denomination and country of origin. Based on the way we previously outlined, our system may simply be expanded to handle new nations' currencies. Currently, it covers twenty of the most frequent ones. Our approach is both faster and more accurate than the rudimentary method of pixel-by-pixel comparison. So far, we have found that, compared to the rudimentary method, our suggested algorithm significantly improves upon it, identifying money and denomination in an average of 5.3 seconds. Nevertheless, our suggested approach focusses on a small subset of monetary systems. We have decided to just support 20 of the most

popular currencies out of more than 180 that may be included into the system. The system should also be able to detect damaged notes. Under these circumstances, our system fails to provide. We can address this at a later time.

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