

SMART SYSTEM IN CURRENCY RECOGNITION FOR VISUALLY CHALLENGED PEOPLE WITH AUDIO IDENTIFICATION

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Abstract: In every field we are using machines to replaced humans by technological advancement. By introducing these machines banking automation have reduced workload. If some task like currency handling will perform more care are simplified by using this banking automation. Handling currency should be recognized by using these machines. We have implemented Principle of Component in this paper. First the principle component is identified. And then weight vector is computed at the same time. By using Mahalanobis distance the weight vector is computed. A class is determined for the small prediction of image having the least measuring distance. With 96% numeral feature of RBI seal denotes unknown amount. We have sorted of integrated with many currencies of ATM machines, this is our proposed currency recognition system.

Keywords: Automatic vendor machine; principal of component analysis; automatic banking and teller machine; weight vector machine.

1. Introduction

Medium is easy for exchanging goods and services of currency. We have to form the currencies by the governing bodies within the area. It is the simple process to identify the denominational value of a money recognition. For normal human beings it is very easy to recognize the money, but it is a challenging task for blind people. Currencies of vending machine, ATM machine both taken only by machines. Reduction of money is very difficult for both visual people and machines. Humans will identify the currency with themselves by the pattern analysis. A difficult task for finding the currency of analyzing machines.

It has both intrinsic and extrinsic cash properties. It comprises size and width of the external properties of the extrinsic features. The circulation period the money may damaged. A specific color and texture pattern for money follows denomination of RBI.

Fully based on neural communication network in the currency recognition last research. If we use the neural network the process will be overhead this is the

main drawback. Future research will be fully based on the image processing methods.

In the next session II, describe the previous research of currency recognition. Proposed method is explained in session III and IV. In session V conclusion of our work is depicted.

2. Literature Survey

It is designed by visible or hidden currency features. These features are used for classification of paper currency recognition system. A simple method was introduced by Hassan pour et al. However, there is no use in introducing this method. Hence, visible features are damaged.

The research is based on neural network and image processing. Vila et al [5] in the year of 2006 coined the currency using as a symmetric mask system. Back propagation neural network is later fed into the pixel value. A method for finding the currency was introduced by Hassan pour et al [6] year of 2007. Currency textures are designed as HMM in this method.

This method was founded using the gene algorithm in determining network structure and appropriate weights. So that the back propagation neural system will reduce in less time. Junfang Guo [10] at 2010 proposed another method called Local Binary Pattern (LBP) improved version of local binary pattern. Input image is divided into number of blocks. Then the lower value of each block is designed. Then using LBP value, of the some blocks is generated. Finally, the histogram will be founded. Further normalizing the block histogram can be done by using the value of blocks. At last, the entire LBP block is integrated to a multi-dimensional vector. For each input image the system will block the generate a vector and this vector will be compared with the vector that is being generated from the template image. Kuldeep Verma et al [8] in the year of 2009 introduced a method for paper currency recognition using the texture features of Indian currency. In this method, five features are extracted from the input currency image using the Region of

Interest Payam M [7] at 2009. Texture features of input image are obtained from the extracted features. From the group best texture feature is used for classification. Using Eigen face, author proposed face recognition. Using the analysis method, the Eigen vector is

computed normally in the currency recognition. This is the proposed system of the currency recognition.



Figure 1. Sample of Indian Currency region of interest marked

3. Proposed System

A. Dataset Preparation

By using the flat scanning machine the dataset are done only by the preparing of the datasheets. By scanning of paper in the front side of currencies at 150 dots per inches. But here only the currency are denoted as 50, 100, 500 and 1000 in the year of 2011.

B. Feature Extraction

By marking the region of Interest the total of five features are extracted towards the scanned currency of the image. Here we are extract the features of shape, center, RBI seal, Latent image and Micro letters.

The processing of the images on the scanning of currency in the banking or the ATM machines to access the data's. If the RGB color is changed to the grey color scale of the format. The ROI feature is followed only by the formation of changing the standard dimensions. The feature will extracted towards the currency dimensions. The images are depicted in the values of ROI dimensions tables.

1) Shape:

This shape feature will be entirely different from that of 100, 500, 1000. Hence this shape feature is contributed towards classification.

2) Center:

Usually center numerical value is found at the front side of Indian currency. Different denominations of currency will have different center numerical values.

Hence for each currency denomination this feature is unique. And it could contribute towards the classification.



Figure 2. Central Numerical value

3) RBI Seal:

If the seal is feature on the right bottom corner or at the right corner of the currency. If the reserve bank of India has been authorized due to the print and calculate the Indian currency. It shows the difference for the RBI seal. Then only the formation of the currency is sealed to the different denominations. In this machine, the benefit of the money will be used in the RBI seal. There is any changes in the machine will activate towards the currency recognition. The RBI seal is must used anywhere in the money because, it is used to denote the value of currency. To identify the amount has been used in the ATM machine or the bank. This is the feature of the seal which has been used in the RBI.



Figure 3. RBI Seal feature

4) Micro Letter:

Micro Letter is a security feature that is given by RBI for recognizing the currency. In this, feature is always placed in the value of currency is printed over the right corner of the Gandhi photo in very little fonts. It also consists, text "RBI Bharat" which in both English and Hindi. It differs in both denominations.

Micro letter is used to identify the fake currency notes. For each input image micro letter feature is very important. For each input image, the system will generate a vector and this vector will be compared with the vector generated that is being from the template image. In the feature of changing the denomination of the formation of currency.

In this section, the currency will provide the many features of the money in the ATM machines. If the saved networks are used anywhere in the machines to deliver the machines. There is a lot of feature in the micro letter one of the main thing that is used only for the visually challenged people, to identify the currency in the ATM machine.



Figure 4. Micro letter feature

5) Latent Image:

Currency must be located at right side of the corner in the latent image. By using the special link the value is printed on the currency recognition. In addition, it is visible only to eye at certain angles. The denominations will be different from the all features will be in the form of some patterns.

Feature extraction is extracting the micro features and letters present in the currencies for identification. These methods will prevent the circulation of fake currencies and reduce the workload in banking automation.

Audio response will add additional information to the identification. Later the image will be extracted towards the feature extraction then the machine changes automatically. If the generalized images are captured, only through the passing the data is to the input values of the images. Then the visually able people also can use this method to find the currency easily on the ATM machines. So the people use this latent images so far on the currency recognition.

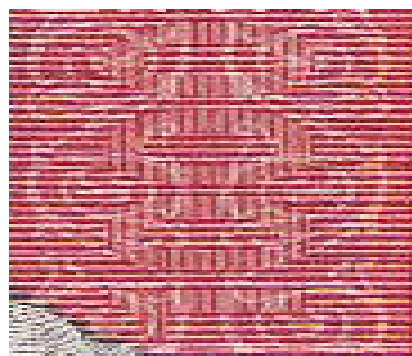


Figure 5. Latent Image feature

C.Analysis Principle Component

This method is used and study for the PCA purpose, in currency recognition. It is used to develop the employed of analysis of Eigen vectors to detect the face images. Later it was developed in the form of representing the images of weight vectors. Then the direction are changed from N to the K dimensions of the projecting vectors. It will accompanied by the weight vectors. In between of two weight vector and the sample weight vector are used in this paper to computing the prediction.

In the top of Eigen vector the value of $K=4$ is corresponds to the PCA. There is no option to select the values for K in the 4 denomination of the only features. While selecting the values for K in the sample images on the top of Eigen images. Where the PCA is used for the Eigen values of the images on value $K=4$.

The sample vector is calculated during the position of the training sample vector and is projected to the

Eigen spacing vectors. We use only the transpose vector to change all the problem on the final result. If the projection of the Eigen value is computed together in the form of currency recognition. If the dimensions are used to detect the currency. If the input images are used on the currency. The transformation is used here to change the lower dimension space in the training. When the T of vector of input images are in higher dimensions.

Where the Eigen vector if the image is calculated in the form of changing the size, range in the Eigen space vector.

It has been used anywhere in the automatic machines where the entire world. Only the atm machines are cover all the currency after regonisation. In this we use the Mat lab coding to deliver the message from the sender. Once it receives the currency the component may or may not be accessed fully. It may stops suddenly when they change their analysis. In this case, the PCA may varied after getting some useful message on the machines we have to calculate the average image of the currency to get the note is fake or real by using this component analysis method.



Figure 6. Latent image

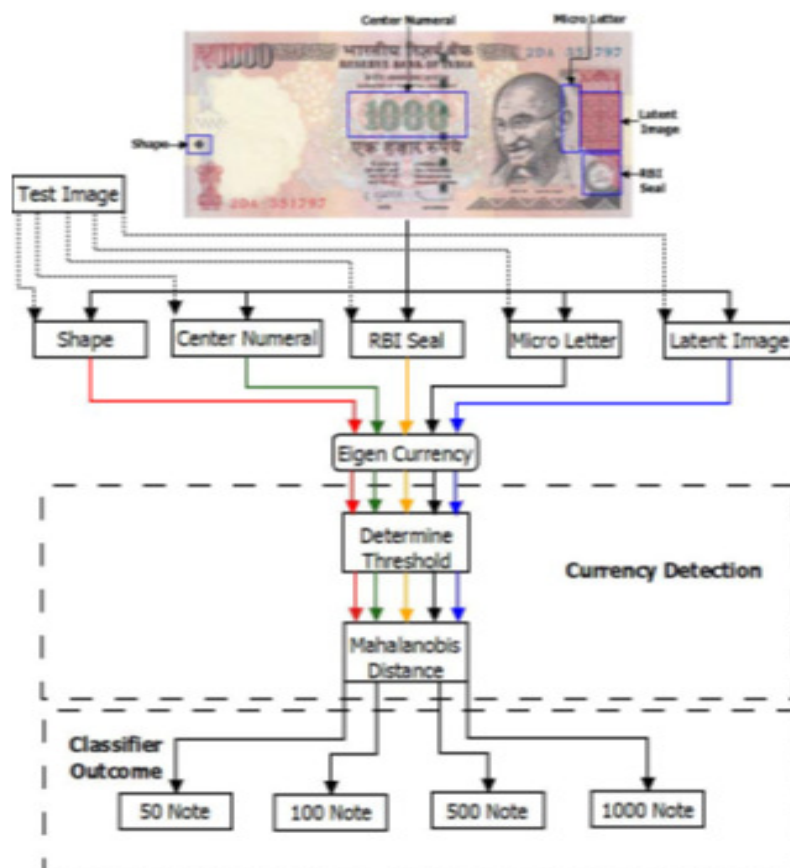


Figure 7. Architecture of principle component analysis

4. Experiments And Results

A. Experiments

By scanning 25 currencies of different denomination (1000, 500, 100 & 50) the database of Indian money is created. By the year of 2010, the currency were printed in the dataset. The 150 dpi are scanned in the resolution of currency. It is divided into two halves in the dataset where one is for training and the testing phase is used for another set.

By using histogram equalization only the images are normalized. A rectangular phase of images are placed by some identification of five feature of ROI. Images are extracted towards the PCA module and it generates the average image of the number of n input images. The values and vector of Eigen are computed together and the corresponding values are determined of the covariance matrix vectors. In the Eigen space with the new space of images are projected together known in the image, high variance are indicates by the PCA.

Normal images are considered on the prediction phase method. Where sample is extracted by the input image, then the PCA module which has been equal to the normalized vector to test some feature of this project to the Eigen vector and space. The Mahalanobis distance and the weight vector of the image is tested and computed with some of the classes. Therefore some of the feature similarity of the test image is found to be high on the input images on the Eigen vector or the Eigen sample output image. Where it is used for the disabled people can also helpful for this experiment.

B. Results

By using the system of CV 2.3, it has been developed. Many variations of the denominations of 100 amounts of currency were can be used to test the system. Where the prediction is also used in the currency. Each feature is extracted in the performance of the detection of the identification.

Both the numeral value and the currency are identifying by the experiment. The RBI seal can be one of the best features, it provides the information about the recognition. It is totally different from all the denominations of the fake currency. Next example is the central numeral feature is the most important extracting method to find the amount in the atm machines. If one of the value is identify the numbers on the central value. Where it is unique of all the extraction on the class of distinct fake currency.

Many shape of feature is extracted on the material. Which can be implemented on the currency, where it not be reliable. It cannot be used on the identification of the damaged notes on the material. It can be polluted towards on the circulation of currency. It will be the difficult task to play the major role on the money

extraction. If the visually disabled people easily used on the dispatched material. Where the denomination of the value are used by the lens to printed on the currency machines. For our experiment on the it can be clear that the both the value of numeral and the seal has been declared on it. The fonts size will medium to blurred on it and become to read the feature extracting material on the Atm machines.

Recognition Phase:

In between of two images the class of input will determine the distance d in the sample weight vector. Where the Mahalanobis distance is showed below. The system will recognize the feature of performance is computed in terms of TDR separately.

The total number of distance is proportional to the number of TDR of instances. The false detection is identify by the default and it is already designated.

Where the RBI seal and numerical value will identify in our experiment using of the Indian currencies. RBI seal which gives us more information about the fake money for classifying the currency. For each denomination is different RBI seal is used here. Another important feature is central numerical value and is used for the detection purpose with high rate. Numerical represents the central value has different denominations. Where its uniqueness is use for every distinct class of fake currency.

It is unique shape of feature for each class of currency. Were it is not reliable. It cannot find the system appropriately shape of feature on the system. In the period of circulation the currency may or may not get polluted or damaged on the system, of the challenging task. Indian currency is used in the latent image of the another feature and cannot be used for the system. In the special link for printed images are used as the denomination of the special things.

The detection of the micro letter feature is less than that of the value of currency, printed in the time of size, and is readable only under the lens. It is contaminated with the currency size of the blurred images on the risk to read for the difficult of the visually disables people. If the people are used the values of Eigen vector more than the system used. Then it automatically used in the ATM machines.

6. Conclusion

With the help of MATLAB tool, only we have implemented this project. Algorithm is fully based on the currency recognition. This algorithm shows that appropriate preprocessor, extracting features and its matching of extraction. Where hamming distance is fully done with the help of many classification. Here some more matrix are used to correct the amounts, where indicates the note fake or not. We can also use the matrix confusion method is useful to find the currency. We can use the help of to display result as in

graphical user interface. For visually challenged people also use this method for the atm machines and it implemented with the help of transactions money to involved in this system. Future it may used by both the human begins.

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