Fake currency detection using MATLAB

TERM REPORT

ABSTRACT:

Fake currency notes are increasing day by day. In order to find these fake currencies, A system based on image processing is proposed. MATLAB software is used to implement the system and extract the features of the note. The result will predict whether the currency note is fake or not.

Keywords: Fake currency, Color thresholding, Gray-Level Co-Occurrence Matrix (GLCM) Technique, SVM classification.

LITERATURE REVIEW:

Over the past few years, a lot of research has been done in the field of Fake currency detection. In [1] classification using support vector machine is studied. The images of currency processed using a variety of preprocessing techniques and different features of the image extracted using local binary pattern technique, once the features are extracted it is important to recognize the currency using effective classifier called Support vector machine and finally a prototype able to recognize Indian paper currency.

In [2] GLCM technique-based texture feature extraction is studied in this literature. The proposed method feature extraction is based on the characteristics of Indian paper currencies. The first order and second order statistical features are extracted initially from the input. The effective feature vectors are given to the SVM classifier unit for classification. This method produced classification accuracy of 95.8%. In [3] The dimensions, types and features of Indian Currency notes are studied.

INTRODUCTION:

The technological advancements have made a pathway for currencies to be duplicated such that it cannot be normally recognized. Advanced printers and new editing computer software are used to create counterfeit currencies. Fake currencies can just be slipped into bundles of genuine currency which is how they are usually circulated in the market.

A method is proposed based on texture feature extraction and machine learning. The proposed method feature extraction is based on the characteristics of

Indian paper currencies as GLCM Technique is used. The first order and second order statistical features are extracted initially from the input. The effective feature vectors are given to the SVM classifier unit for classification. Output is displayed in a message box. SVM is one of the classifiers which are used effectively for various image processing applications such as segmentation, scene understanding, classification.

METHODOLOGY:

1). *Acquisition of image*: Image acquisition is a process of capturing images of banknote to preprocess and enhance quality for further processing techniques.

2). *ROI cropping*: This step thresholds RGB image using color thresholder app and binary masked the image where currency is present. Segmented image is composite RGB image.

3). *Preprocessing*: The obtained image is now converted to grayscale image and resized accordingly.

4). *Feature set extraction*: Texture features are extracted from ROI cropped images and then converted into feature vectors. These feature vectors are used by the classifier to recognize input units and target output units. GLCM technique extracts second order statistical features.

5). *Training Support Vector Machine*: The extracted feature vectors are used to train the system. Training process involves learning the patterns of the training banknotes and then outcome of Training is Support vector classifier.

6). *Classification using Support Vector machine*: Once collecting feature vectors of banknote, it is necessary to recognize the pattern of the banknotes on the base of these extracted features. The result of this classifier model predicts whether currency is fake or not.
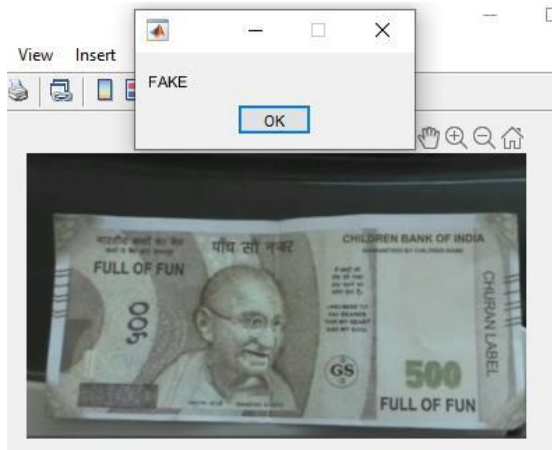
SIMULATION RESULTS:

Fig.1. Fake currency detected.   **Fig.2.** Real currency detected.

- **Figure 1** shows input image and result in a message box after processing. The currency was found to be fake and a 'FAKE' message is displayed.

- **Figure 2** shows input image of the currency which was found to be genuine and a 'GENUINE' message is displayed.

CONCLUSION AND FUTURE SCOPE:

The proposed approach follows an image processing technique followed by the machine learning technique. With use of Support Vector Machine, the identification of counterfeit note is done. The proposed method can be implemented for real world applications by incorporating more number of features in the extraction phase.

However, there is a need of rigorous testing in a variety of currency situations for a complete verification of the proposed approach, which shall be the future work. Furthermore, there is a scope to detect counterfeiting and extend support for all kinds of country specific banknotes. Also, the use of Deep Learning techniques with large amount of training data may be applied for better predictions.

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