RAMAIAH Institute of Technology

DIGITAL IMAGE PROCESSING
Report

Topic:-
Indian Currency Recognition Using Image Processing

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Abstract

In this paper, we propose a system for automated currency recognition using image processing techniques. The proposed method can be used for recognizing value of a given banknote. The main purpose behind this study is to recognize Indian paper currency with this hybrid approach which is portable and making an application used on the go. In this study, the Indian currency note features will be extracted and will be stored in MAT files and then these stored features will be matched with the input paper currency to recognize. Only paper currencies have been considered. This method works by first identifying the country of origin using certain predefined areas of interest, and then extracting the denomination value using characteristics such as size, colour, or text on the note, depending on how much the notes within the same country differ. Our system can accurately and quickly identify test notes.

Introduction

CURRENCY is a token that is exchanged for purchasing goods or services. Currencies can be in diverse forms such as metal, paper, polymer etc. Paper currencies is used for transaction in different countries as they are easy to handle, cheap to manufacture and durable. A currency recognition system recognizes currency and predict the denomination by analysing the prominent attributes. An efficient recognizer makes use of few significant features for detection. Many researchers have developed several methods for currency recognition. Some methods use physical properties (ex-length, width, and thickness) also referred as extrinsic features of the currency. A few researchers use internal properties (ex-colour, texture etc.) of the currency for recognition. External features are not reliable because many countries may have currencies of same dimension which may lead to false detection.

Tremendous advancement of technologies in banking sector has resulted in the introduction of self-servicing kiosks for making banking transactions simple and customer friendly. Currency counting machines is another application where currency recognizer is used. Presently, banks have introduced cash deposit machines where in customers can deposit cash to their account without visiting their bank. Here a currency recognizer is required to check the deposited currency and sort the money based on denominations.

Problem statement

To write program that can easily recognize Indian currencies, using Image processing Techniques.

Objectives

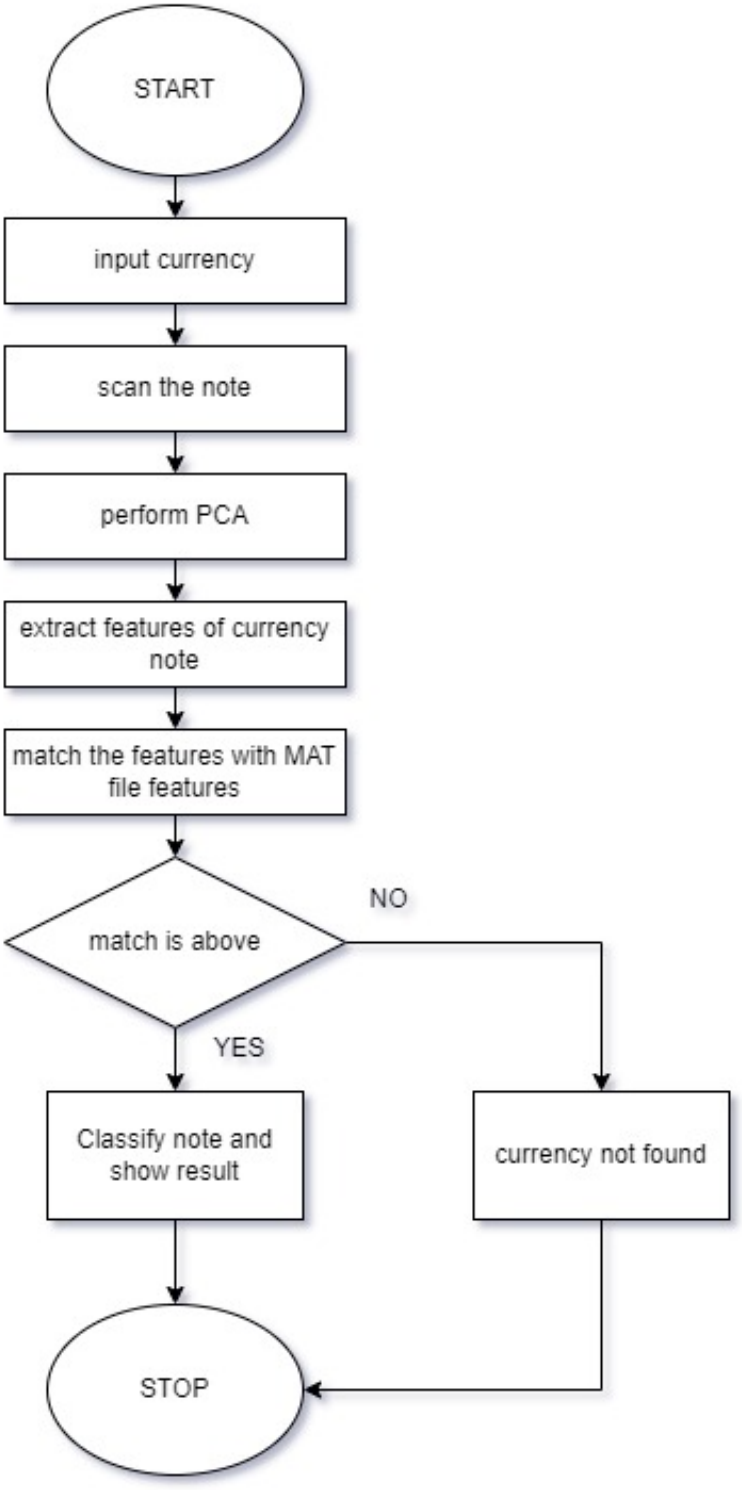
1.To Recognize currency

2.Extract features of uploaded image

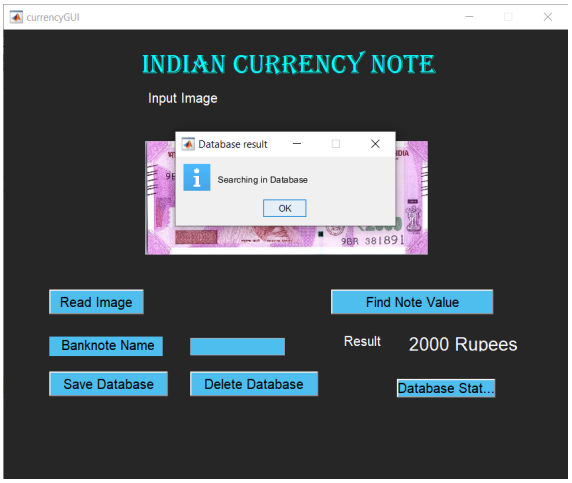
3.Display Result in well define GUI

Methodology

The steps of investigation are (1) dataset preparation (2) prepare train and test set (3) feature extraction (4) projection of features in eigen space (5) construct classification model using principal components and finally (6) predict unseen samples. The outline of the proposed method is shown.



Experimental result and analysis



The recognition will be done on the basis of these 6 features. Currency recognition: It includes the hybrid algorithm which is based on LBP and PCA. Euclidian distance is also used for the matching purpose. After completion of this process it will display the matched currency with a message box with its category, to which category currency belongs to. E.g. 10, 20, 50, 100, 200, 500, 2000

Conclusion

Thus the method that proposed in this paper have been implemented successfully and experiments are conducted. Center Numeral is found to be the best feature for recognizing Indian paper currency in this method with accuracy of 100% and also concluded that shape feature is not performing well.

References:

1.Takeda F, Omatu S, High Speed Paper Currency Recognition by Neural Networks, In Proceedings of IEEE Transactions on Neural Networks, Vol. 6, No. 1, pp. 73-77,ISSN:1045-9227, Jan 1995
.
2.Frosini A, Gori M, Priami P, A Neural Network-based Model for Paper Currency Recognition and Verification,In Proceedings of IEEE Transactions on Neural Networks, Vol. 7, No. 6, pp. 1482-1490,ISSN:1045-9227, Nov 1996.

3.Takeda F, Nishikage T, Multiple kinds of Paper Currency Recognition using Neural Network and Application for Euro Currency,In Proceedings of IEEE-INNS-ENNS International Joint Conference on Neural Networks (IJNN-2000), Vol. 2, pp. 143-147,ISSN:1098-7576, 2000.

4.Er-Hu Zhang, Bo Jiang, Duan Jing-hong, Zheng-Zhong Bian, Research on Paper Currency Recognition by Neural Networks, In Proceedings of International Conference on Machine Learning and Cybernetics, Vol. 4, pp. 2193-2197,Nov 2003.

5.A. Vila and N. Ferrer and J. Mantecn and D. Bretn and J. F. Garca, Development of a Fast and Non-destructive Procedure for Characterizing and Distinguishing Original and Fake Euro Notes, In Journal of Analytica Chimica Acta, Vol. 559, No. 2, pp. 257-263,ISSN:0003-2670, 2006.

6.Hassanpour H,Yaseri A,Ardeshiri G, Feature Extraction for Paper Currency Recognition, In Proceedings of 9th International Symposium on Signal Processing and its Applications, 2007 (ISSPA 2007), pp. 1-4, February 2007.

7.Hamid Hassanpour, Payam M, Farahabadi, Using Hidden Markov Models for Paper Currency Recognition, In Journal of Expert Systems with Applications, Vol. 36, No. 6, pp. 10105-10111, 2009.

8.Cao Bu-Qing, Liu Jian-xun, Currency Recognition Modeling Research Based on BP Neural Network Improved by Gene Algorithm, In proceedings of Second International Conference on Computer Modeling and Simulation 2010 (ICCMS '10), Vol. 2, pp. 246-250, January 2010.