Image Based Currency Recognition System

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Abstract

The people may not recognize the original currencies from different countries. So, to solve this difficulty to the people, the system called “Image based currency recognition system” is helpful. However, the currency recognition system based on image analysis is entirely not sufficient. But, the proposed concept which is based on image processing will makes the process automatic and also robust.
1. Introduction

Even though the size of the currency paper is different with each of them looking different for different currencies all over the world, the color and pattern are different that we can’t recognize which currency belongs to which country and it is also difficult to recognize the fake currency note also. It is mandatory to differentiate different types of currencies for the personnel who are working for money exchanging which is not an easy job. By mistake, if the money exchanging workers con not recognize the currency correctly, so many problems will occur. So in order to help the work of those personnel, they necessitate an exact and efficient system.

There is a “Currency Sorting Machine” for the bankers so that they easily recognize the currencies of different kinds. The main purpose of this Currency Sorting Machine is image acquisition and recognitions and the technique is also named as optical, mechanical and electronic integration which process image with high speed which is accurate and highly efficient. The proposed system is based on image processing and it includes image filtering, edge detection and segmentation like that.

2. Block Diagram

Image analysis and image processing are the major techniques in this system. These are the part of computer science and cognitive. Image processing is a pre-processing followed by signal processing. The output of the system can be either a set of characteristics or an image or the parameters related to the image. The image is regarded as 2-D signal generally and it applies some standard signal processing techniques in which image-processing techniques are involved. Image analysis is nothing but the meaningful information from an image which is extracted mainly from digital images by means of digital image processing techniques.

![Fig. 1: Block diagram](image-url)
3. Image Segmentation

Image segmentation is defined as the process of partitioning of a digital image into multiple Segments (sets of pixels). The main aim in segmentation is to simplify and change the representation of an image into the more meaningful and very easy to analyze. Generally Image segmentation is used to locate objects and boundaries in images. Segmentation algorithm for images generally is based on one of the two basic properties which are given below.

1) Similarity: Based on partitioning an image into regions that are similar according to a set of predefined criteria
2) Discontinuity: Based on sudden changes in intensity such as edges in an image.

The aim of image processing is to suppress undesired distortions or enhance some image features that are important for further processing or analysis. Here image processing includes these parts.

1. Image adjusting.
2. Image smoothening (removing noise).
4. Feature Extraction

Feature extraction is simply transforming the input data into the set of features. It is expected that the features set will extract the relevant information from the input data if the features extracted are carefully chosen. It happens in order to perform the desirable task using the reduced representation instead of the full size input. By this technique the numbers of lines in the real and fake images are found to make the real note pixels values unique.

5. Results

Here the format of the input image used is JPEG (JPG). The system is realized by using MATLAB. That is because MATLAB is a high level technical computing language and it has varied API for image processing, the algorithms are succinctness and terseness. It also speeds up the image processing and making it more efficient. Users won't feel any time hysteretic, which can satisfy and achieve currency real-time detection.
This paper proposes an algorithm for recognizing the currency using image processing. The proposed algorithm uses the primary color and a part of currency in hsv components by fixing the saturation and value threshold levels for recognition. In future the on basis of image acquisition, multiple parameters including correlation matrix, edge detection operators, color check etc were also considered.

6. Conclusion and Future Work

Fig. 7: Post processing results

Fig. 8: Counting of lines in images
References


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