Note To Coin Exchange Using Image Processing

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Abstract-In daily life, we have to suffer a lot for the change (Indian currency note) in various public places. The need of change (Indian currency note) has been increased. Rather currency coins are used more instead of note in various places like malls, parks railway station, bus stations; even in rural areas currency coins are required. Above mention places we required lots of coins, so we thought to develop a system which will give us coins instead of currency notes. As there are various methods to detect the Indian currency note, these methods are texture based, pattern based, checking the micro letter, colour based recognition technique.
 The main purpose of designing this simple and efficient system which will fulfill the need of currency coins for transactions in olden days the value of coins was much more than what it is in day to day life. Thus the system is planned for that the people will not face problem of coins at various public places. This project will provide coins for currency note with respect to given note inserted, for this purpose we have developed mechanical coin dispensing unit which will accepts the note inside system and checks whether note is fake or real,if the inserted note is real then camera takes picture of that note. After that this will find out its value using image processing technique then it will gives the coins with respect to inserted note from dispenser unit. Thus in this manner we are trying to design a strong and efficient system which will be having a very small production cost as compared to other existing machines.

Keywords: Matlab Algorithm, Currency Note, Image Processing Technique.

1.Introduction

In Our Day-To-Day Life We Come Crossways With Problem Of Not Receiving Coin In Various Public Places. The Importance Of Coin In Today Is More In Fact Coins Are Respected More In Places Such As Bus Stations, Malls, Railway Stations, Even In Rural Areas. Now Days Also Coin Is Used For Telephone Systems. For This Many Application Areas Coins Are Widely Used, So Proposed System Can Help In Solving These Problems. In This System, Note Is First Checked For Its Actuality I.E. Whether The Note Is Fake Or Real And After That It Will Provide The Change In Proceeds. There Are Lots Of Technique To Detect The Indian Currency Note, These Are Texture Based, Pattern Based, Checking By The Watermarking, Colour Based Recognition Method. The Most Preferable Technique Along All These Is Colour Based Recognition. For Detecting Kind Of Note The MATLAB Algorithm Runs And The Effect Is Given To The Controller Which Will Influence The Coin Container Through Relays And Motors, The User Simply Press The Keypad For Which Type Of Change He Wants Whether One Rupee, Two Rupee Or Five Rupee Coin Or Mixed Coin And Hence In The Output We Get Coins As User Requirement.

2. Implementation of note to coin exchange

3.1.1 NOTE PLACING UNIT:

It will accept note from the customer.it consists mechanical Design of relays to take the respective note from the customer.It takes 12v to drive the DC motor of 10RPM.There will be 3 relays and 2 DC motors at the user side to take the note inside the device. This information is sent to the microcontroller for further processing.

3.1.2 RECOGNITION USING IMAGE PROCESSING:

Image processing technique is a immense in this there are lots of technique to detect a note these

are pattern based, texture based, checking by the watermarking, checking the micro letters, and color based recognition technique.from the above The most preferable technique is color based recognition . It is constructing by counting the number of pixels of each color. Histogram describes the global color giving out in an image.

It is easy to compute and is not sensitive to small changes in viewing position. The subtraction of color histogram just includes counting the number of pixels of specified color. Therefore in an image of resolution m*n, the time complexity of computing color histogram is O (mn). It is quite not sensitive to small change in viewing point this feature is particularly desired in this project as the VP from which the image of currency note will be acquired can change.

3.1.3 KEYPAD:

Keypad is the user interface.There are 4 keys on keypad: 1.start 2.1rupee coins 3.5rupee coins 4.mix coins Now the user can select the mixturing in the form of 5's,1's or 5's and 1's.

3.1.4 COIN COTAINER: This unit consists of two stepper motors. 1 motor is used to dispense coin of 1.and the motor 2 is used to give the coin of 5 rupies . drive the motor 1 will give the 1 rupee coins to the customer and motor 2 will give the 5 rupee coins to the user. Incase of mix coins, the controller will cheak for availability of all coins in the coin container and then as per the requirement of user the keypad,the mix coins will be give to the user. If the coins as per the requirement of the user are not present in the coin container then a message will be displayed on LCD screen that is "insufficient coins".

Fake currency note detection, currency note identification and currency note recognition using image processing are as follows. Image processing technique is a hard. in this there are lots of technique to detect a currency note these are text based, pattern based, checking by the watermarking, checking the micro letters, color based recognition technique .The most commonly used technique along all these is color based recognition . It is constructed by counting the number of pixels of colors. Histogram describes the global color giving in an image. It is easy to compute and is not sensitive to small changes in viewing position. The computation of color histogram just involves counting the number of pixels of each color. Therefore in an image of no of pixel m*n, the time

complexity of computing color histogram is O (mn). It is quite not sensitive to small change in VP this feature is particularly desired in this system as the VP from which the image of currency note will be acquired can change.

Color Fake currency note detection which is not perform by general LED lighting because the UV pattern is not reflected under general LED lighting.To examine paper money using UV-LED, the paper money image must be separated into a pattern and a environment.There is a method of separating an image into a pattern and a background using a threshold value (Vth). This method finds a histogram of the image, determines the (Vth) value, and classifies the image. Histogram-based Vth decision methods exist such as Otsu's method [1] and Huang and Wang's method [2]. These methods are used in separating an image into 2 objects. However, these methods are not easy to separate more than two objects. Because, computational complication increases rapidely as the number of objects increases. Therefore, in order to separate an image into no of objects, a suitable method is essential.The method using Gaussian mixture model (GMM) cansegment an image into many objects. This method synthesizes n of normal-Gaussian PDF to section the image. The method is explained in brief, first, we obtained a UV-image of the paper money using UV-LED lighting.The UV image was separated into the RGB value and we selected the G value. Next, find the gray-histogram of the G value and then find optimal mix component number selection by using BIC and standard deviation. Then ultraviolet image segmentation by using GMM. As shown in Fig. 8, the UV-image was segmented into five parts. Then, It was classified as the surroundings from the first part until the third part. And the fourth part and the fifth part were classified in the ultraviolet pattern. However, this categorization is little by little difference. Because, the shape of fluorescence pattern is different for each kind of money. When the fluorescence pattern of the paper money was big, the UltraVoilet pattern existed in the fourth part and fifth part. However, when the fluorescence pattern was small, the UltraVoilet pattern only existed in the fifth part.Therefore, in order to segment the UltraVoilet pattern using GMM,we have to choice the part from segmented UV-image. This judgment was performed according to the characteristic of the paper money.

A video camera is designed to capture an image – either in a single "frame," or in a series of frames, over a period of time. Prior to solid-state cameras, video camera are used for photosensitive "tubes," similar to television or cathode ray tube, to convert arriving light into an electronic signal that

could be sent to a transmitter, or to video recorders which used magnetic "heads" to capture images on magnetic tape. Modern solid-state cameras can capture images in a broad range of light conditions. It is possible to produce an image using a shutter speed of less than 1/800,000 second, or to leave a shutter open for many seconds to accumulate necessary light. Cameras are designed to work in both of theses extremes. Examples would be a time exposure to photograph a dim star, or an extremely quick shutter speed to capture a bright explosion. the sensitivity of its cameras using the *lux* unit of measure, which is based on the amount of light falling on a given area (1 lux = 1 lumen per square meter). This rating provides an indication of the minimum illumination level at which the camera can produce a reasonable image, and is determined by JAI without a lens attached to the camera.

4.ALGORITHAM

MATLAB Algorithm for note denomination detection:
1. Initialize.
2. Set threshold 'th'.
3. Set COM port for serial communication.
4. Wait for to be received on serial port from microcontroller.
5. When arrives get snapshot of note by using camera.
6. Make edge detection and segmentation on image.
7. Compare with the reference image.
8. Cropping the image Top and Bottom by 40 pixels Left and Right by 50 pixels.
9. Set threshold "m" for Binarization of image.
10. Binarize the image if above "m" store 1 in image matrix.If below "m" store 0 in image matrix.
11. Calculate percentage of 1 present in the image matrix.
12. If percentage of 1 is more than threshold "th" send "2" on serial port as denomination for Rs 20.
13. Else send "1" on serial port as denomination for Rs10.
14. Go to step 3 until counter becomes full.

5.FLOWCHART
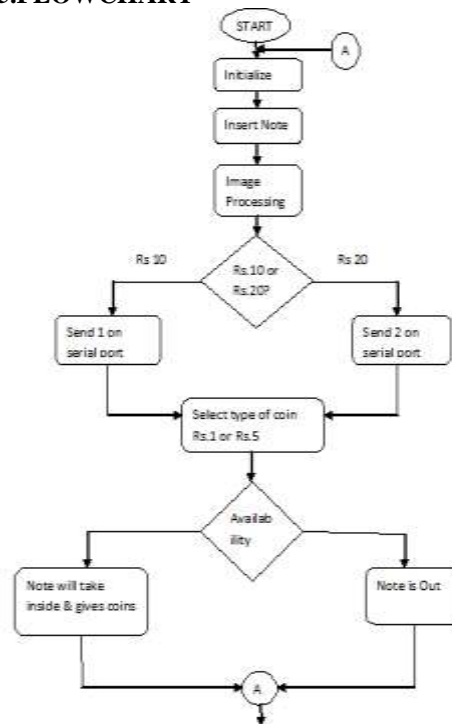
6.CONCLUSION:

We are going to develop an diferent and interactive system that generates currency recognition note to coin system using localization and colour recognition with the help of image processing or MATLAB. The proposed system will be useful in day to day life of each and every common man where people have to suffer for need of lots of coin at many public places.As mentioned in the applications this system is an real time application for all real time places.In the future this system can also be applicable in the buses itself.This will be a very helpful for the conductors and passengers.

7.REFERANCE

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