

COUNTERFEIT CURRENCY MACHINE FOR VISUALLY CHALLENGED PEOPLE

Field of Invention

Present innovation deals with a design of a device to check whether the strip is broken or strong line in a paper currency. To identify the fake currency, two pictures to be taken, one representing real money and the other denoting a fake one. Crop the picture at the position where the strip exists and finally check the black pixels. It can be checked whether the note is original or duplicate by fact the genuine note does not have any fragmentation in the strip while the fake one has many fragmentations in the strip. At last, if the currency note has more than one strip then that is fake currency note and in the same way if the currency note contains only one strip that that is real currency note. By this method, the proposed device will help the physically challenged to detect the currencies.

Background of the invention and the prior art

Wang Zhenyuan published as CN105023339 filed on A Currency detector capable of detecting currencies of multiple nations. The embodiment of the invention provides a currency detector capable of detecting currencies of multiple nations. The currency detector comprises a horizontal-plane cash input device, transmission mechanism, code plate, a cam, LED light system, a magnetic detection device. Red, green, blue, infrared, and ultraviolet A/D data reflected and transmitted by paper money are analyzed along the length direction of the paper money or plastic money to detect the optically-variable hollow-out windowing safety line, variable-color optically-variable number, white water mark, analog watermark, black watermark, colorless fluorescent printing ink, magnetic safety line, digital ink magnetism, and the length and width of the paper money or plastic money; and thus the authenticity as well as values of the currencies can be detected based on comparison with the A/D data of the real paper money or plastic money.

CN105874514A by Kobayashi Yoshinari invented Cash Transaction Machine to enhance the functionality of an automated cash transaction machine. An automated cash transaction machine is disposed with a currency bill deposit/withdrawal unit that accepts currency bills from outside, a discriminating unit that discriminates the authenticity of the currency bills and also reads their serial numbers, and a receipt issuing slot and an operation display unit that present, to a customer for each deposit transaction, the serial number of a currency bill judged to be a fake bill by the discriminating unit.

Patent numbered JP2010079838A specifies Currency Discriminator to provide a currency discriminator suppressing an illegal action using counterfeit currency by Nakajima Hiroyuki et al. The currency discriminator includes a sensor for detecting a predetermined physical amount

of a deposited coin, and a denomination discriminator for discriminating authenticity and the denomination of the deposited coin on the basis of the physical amount detected by the sensor. The currency discriminator is provided with a video camera for imaging an object in a predetermined range from a coin slot, and a control part for causing the video camera to image coins when the coins discriminated as a counterfeit coin by the denomination discriminator are deposited in a predetermined number of times or more within a predetermined period.

LIN FENG published as CN106056750A;CN106056750B on Spectral feature molding currency detection method. The present invention relates to a currency detection method, in particular to a spectral feature molding currency detection method. According to the proposed method, by an optical effect-data transformation cooperation function, the currency planar detection purpose is achieved, the material consumption of a currency detector is reduced substantially, the size of a currency count machine is simplified, and the currency detection accuracy is improved.

US2006159329A1 on 20th July 2006 by Bajpai Ram et al., filed on Fake currency detector using integrated transmission and reflective spectral response. A currency genuineness detection system using plurality of opto-electronic sensors with both transmission and reflective (including fluorescence) properties of security documents is developed. Both detection sensing strategies utilize integrated response of the wide optical band sensed under UV visible along with optional near infra red light illumination. A security document is examined under static condition. A window signal signature is thus possible from photo detectors responses for various kinds of documents of different denominations, kinds and country of origin. A programmable technique for checking the genuineness of a security document is possible by feeding a unique code of the currency under examination.

Joshi Murali Manohar et al, published CA2559102A1 on 15th Sep 2005on the improved fake currency detector using visual and reflective spectral response. A currency genuineness detection system with visual discrimination complemented by automatic discrimination using plurality of opto-electronic sensors with reflective and fluorescence properties of security documents is developed. The detection sensing strategy utilizes integrated response of the wide optical band sensed under UV visible along with optional near infra red light illumination. A security document is examined under static condition. A window signal signature is thus possible from the photo detectors responses for various kinds of documents of different denominations, kinds and country of origin. A programmable technique for checking the genuineness of a security document is possible by feeding a unique code of the currency under examination.

The invention disclosed in Patent Numbered CN111290595A by Fan Xinran on Keyboard with currency detection lamp. The invention provides a keyboard with a currency detection lamp. An ultraviolet lamp is arranged at the top end of the keyboard, so that when we borrow money and return money in an office, we can press a key of the ultraviolet lamp conveniently to detect the currency along with the keyboard, and the usage is convenient and misunderstanding is avoided.

WO2019220387A1 by Adari Swarna disclosed a system and method for detecting currency genuiness. The present invention is a system and method to equip the ATM (Automated Teller Machine) with the special hardware to detect the each currency note to determine whether that note is a legal tender or not. The counterfeited currency hardware will work with computer

executable instructions to detect counterfeited notes while feeding and dispensing in to and from the ATM machine respectively. The aim of the invention is to negate the chance of counterfeited currency being fed and dispense from the ATM.

CN106920319A by Cai Shuichai disclosed a Fake currency detection device. The invention discloses a fake currency detection device which includes a fixing block, a thickness shaft and a dust-removing shrapnel. The thickness shaft is disposed above the fixing block. The dust-removing shrapnel is disposed on the fixing block and has a rear end which abuts against the axial extension of the thickness shaft. The fake currency detection device also includes a dust-collecting box which is detachably disposed on the fixing block. The fixing block is provided with a dust-collecting groove thereon. Powders, such as ink and dust which are attached to the thickness shaft are removed through the shrapnel, the powders drop to the dust-collecting groove and are collected in the dust-collecting box through the dust-collecting groove, such that maintenance workers can discharge the powders collected in the dust-collecting box outside the fake currency detection device simply by removing the dust-collecting box from the fixing block and prevent the powders aggregated inside the fake currency detection device from influencing the operation.

Brief Description of the Drawings

The description of the illustrative embodiments is to be read in conjunction with the accompanying drawings, wherein:

Figure. 1 illustrates flow chart for the proposed mechanism using Image Processing Techniques.

Figure. 2 illustrate sample input image which differentiates real and fake currency.

Figure. 3 project the Hue saturation value of real currency note.

Figure. 4 explain Hue saturation value of fake currency note.

Figure 5 depicts the extraction of strip from the currency.

Figure 6 gives the cleaning process of strip from the currency.

Figure 7 is the proposed output from the Image Processing method which can be extended in hardware.

Detailed Description of the Drawings

The proposed invention starts with the idea of detecting fake currency for both normal and physically challenged persons. Before designing as a device, simulation based testing is done. The flowchart explaining the detailed description of the proposed scheme / mechanism is given in Figure.1. The first step in the flow is to do the pre processing image. The real and fake currency image is given as the input to carry the pre processing method as given in Figure.2. The color values in the image can be calculated from the Hue saturation values. The hue saturation images for both real and fake currency are shown in Figure.3 and 4. From the values of HSV, the user can predict the currency. The color, number and position of strips in the currency helps to predict the rupee as original or not. Image segmentation process is applied to extract the strips

from the input images as in Figure.5. Using Feature extraction algorithm, the exact values of strips are calculated and compared as depicted in Figure.6. The comparison of the images is made and the proposed output of the Image Detection algorithm is shown in Figure.7.

Description of the Schematic diagrams of the proposed device

The flow of identifying and predicting the currency as an input image is shown in Figure.1. Any currency that is fake can be identified, verified and detected using the proposed device. After simulating the images, the controller-based device is to be used. This device will consist of controller, sensors and buzzers. The controller once after it has identified the output from simulation, transfers output as voice alarm or any sort of alerting. If the alarm is made then this will alert the physically changed person to identify the currency.

Detailed Description of the invention

The currency note can be differentiated based on their characteristic features. There are various characteristic features on the authenticated currency notes they are as follows:

1. SECURITY THREAD- This security thread is in 3mm with inscription of India. When these notes are tilted the color of this thread can be changed from green to blue.
2. SERIAL NUMBER- Serial numbers with its bank note number can be written from small to big number which is on the top left corner and bottom right corner. The serial number should be unique in style and evenly spaced. The Treasury seal and serial number should be in the same colour ink.
3. LATENT IMAGE-This latent image numerical denomination when the bank notes are held horizontally at eye level.
4. WATER MARK- The mark of denomination numeral and the picture of Mahatma Gandhi and multidirectional number are viewed under light. In fake currency watermark looks thick because oil or grease is applied.
5. IDENTIFICATION MARK- This identification mark helps the blind persons to identify the note by touching it. This mark is made with intaglio print.
6. MICRO-LETTERING- In real currency, a micro lettering feature appears between the vertical band and Mahatma Gandhi picture. The micro lettering feature says "RBI".

This proposed system works with the image of currency taken with the help of a digital camera.

1. The image of the currency is taken with the help of a digital camera or scanner.
2. The input RGB image is converted to a HSV image.
3. The HSV image is given to the processes of edge detection.
4. The strip of the currency is cropped and segmented.
5. The strip feature of the currency is extracted after the segmentation process.
6. The strip feature should be analyzed.
7. The currency is said to be the original note or fake note based on the analysis.

WORKING step of the proposed method is as follows. Read the image taken by the camera through MATLAB tool called “imread”. Since the bank notes are green in color the strips will be very dark. In such cases HSV conversion can be used so that take a look at each component separately. On the off chance that you look at thin dark piece of the fake note, you'll see that each dark line is isolated by significant number pixel while the real note truly has no division. In any case, you'll see that in the real strip above, there are still a few pieces of the line that are disengaged. By considering all things, we should attempt and associate the line together. The pieces of the fake note strip are so far separated while the real one does not have any kind of effect. Shut these pictures by a 6-pixel line that is vertical. Count the number of pixels in fake and real note. Finally, the output will be zero count if the note is real and more than one count if the note is fake.

We Claim

We Claim,

A device and simulation tool that

1. improves the quality of image by reducing the blurness created in the framework of picture.
2. increase intelligibility of the image as currency and coins using pre processing method.
3. corrects the Hue saturation values for all the colors in the currencies and coins as in claim 2.
4. detects the images as coins and rupees with all types of edge detection as from claim1 and 2.
5. segments the currency in the frame as in claim 2,3 and 4 with resolution ranging from minimum to major values.
6. the features parameters of image in above claims for the currency.
7. processor and controller at different range of operating frequency, data rates, memory, clock speed.
8. detect the image using sensor and it also includes the camera image. This sensor can be from low level to high end sensor.
9. works with different ranges of decibels in voice chip or alarm.
10. detects currencies as image as stated in above claims and also coins.

10 claims and 7 pages of diagrams

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Number of Sheets: 7
Sheet No.: 1 of 7

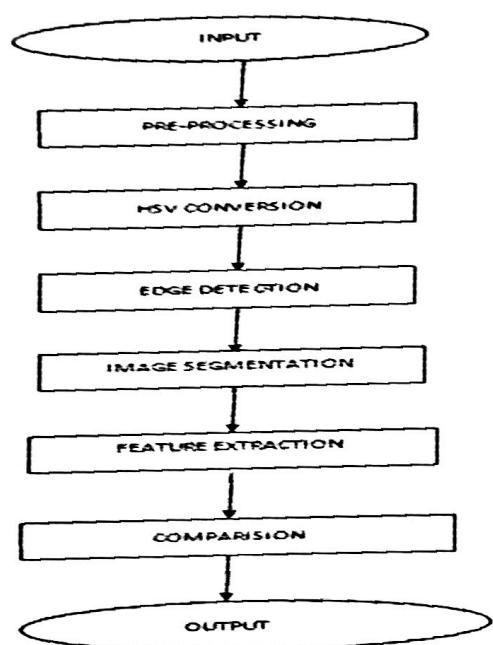
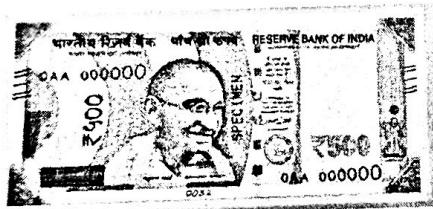


Figure.1 General Flow diagram of the proposed mechanism

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Number of Sheets: 7
Sheet No.: 2 of 7



a) Real Image



b) Fake Image

Figure.2 Real image and Fake Image – Input

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Number of Sheets:7
Sheet No.: 3 of 7

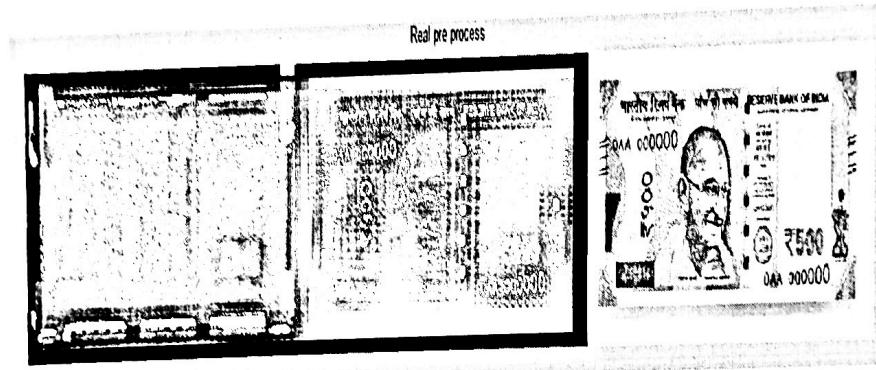


Figure.3 Hue-Saturation-Value of real currency

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Number of Sheets:7
Sheet No.: 4 of 7

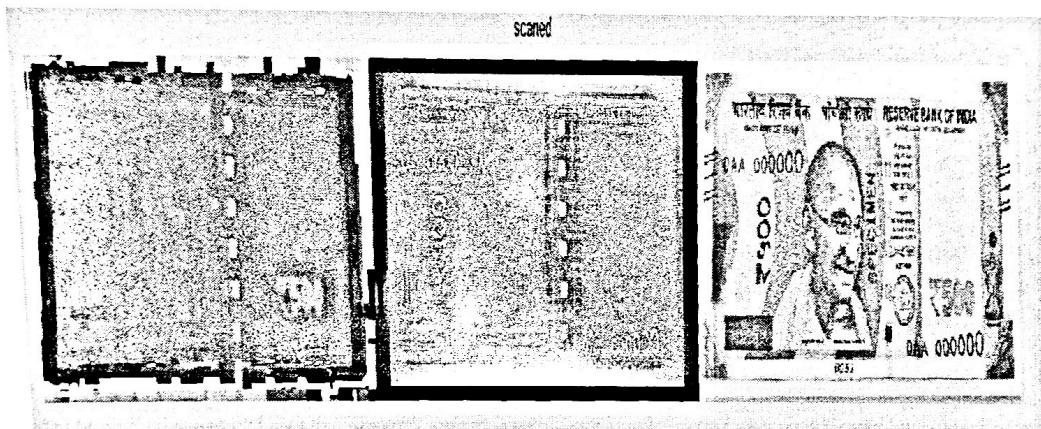


Figure.4 Hue-Saturation-Value of fake currency

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Number of Sheets: 7
Sheet No.: 5 of 7



a) Real



b) Fake

Figure.5 Extraction of Strip

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Sheet No.: 6 of 7



a) Real



b) Fake

Figure.6 Cleaning Process of Strip

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Number of Sheets: 7
Sheet No.: 7 of 7



a) Real



b) Fake

Number of white lines in the real note: 0

Number of white lines in the fake note: 4

Figure.7 Proposed Output from the device

Abstract:

Financial improvement of each country is generally reliant on its currencies and each individual is the part of Economy. At present, in cycle of demonetization, there are long queues waiting in the banks and ATM Machines but at the other hand, many corrupted individuals are giving the cash straightforwardly by underhanded sources and it is straightforwardly affecting on monetary status of India. Numerous scientists have been worked hard to create hearty and effective automated currency detection machines. Programmed machine which can recognize banknotes are currently generally utilized in distributors of present-day items like candies, cool drinks, ticket bookings etc. The innovation of money acknowledgment fundamentally targets recognizing and extracting visible and invisible highlights of currencies. As of recently, numerous methods have been proposed to distinguish the cash note. In any case, this way isn't useful if the note is filthy or torn. In the event that a note is dirty, its shading characteristics are changed generally. So, it is significant those how we extract the highlights from the picture of currency notes and apply algorithms to improve exactness to perceive the note. The fake currency detection implementation was made in MATLAB using image processing techniques. The proposed system from image acquisition to the intensity calculation of the extracted feature. It removes the major problem by extracting features even if the currency is torn or scribbled. The algorithm proposed is also suitable for new 500 and 2000 rupees denominations. The proposed system can be implemented with hardware using suitable processors which will result in the increase of processing speed.

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