

Prompt Indian Coin Recognition using digital image processing

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Abstract

Proposed System detects Indian coins of different denomination. The spiraling business transaction at vending machines and automated systems working on token have spurred better coin recognition techniques, saddled with increased robustness. These techniques facilitate transaction making it easier in all forms of trade. Considering the essential factors, a system has been created which recognizes coin using digital image processing. The process performs notation check on the input image. The stated subsequent check enables the technique to endorse Rotation Invariance for capturing both side coin images. Thus comparison between the input object image and database image is performed. Further, plotting the resultant values gives minima which if less than a standard threshold establishes the recognition of the coin.

Keywords – *Image Segmentation, hamming distance thresholding object detection.*

1. Introduction

Since coins are detected using slot machine but they are not so efficient to detect the coin. Hence our intelligent system of perception has been trained to recognize the objects. However, we are able to simulate our perception of objects and pattern recognition in intelligent machines using slot machine. System proposes a coin recognition method using digital image processing which has an advantage over the conventional identification

methods used commonly in slot machines. Most of the coin testers in slot machines, work by testing physical properties of coins such as size, weight and materials. However, if physical similarities exist between coins of different currencies, then the traditional coin testers would fail to distinguish the different coins.

The image processing takes two images as input and gives a third image as output. The captured image is compared with thresholding value of the data base image, if thresholding value of image is less than original image then coin is detected.



Fig. 1 Front side of various Indian coins



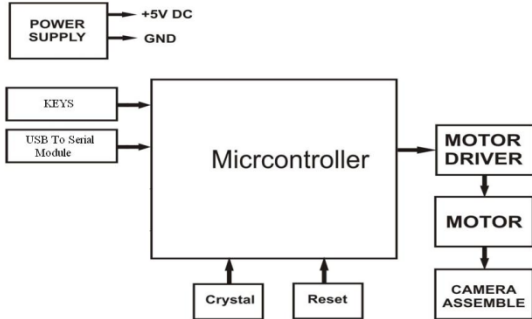
Fig. 2 Back side of various Indian coins

3 PROPOSED SYSTEM:

Proposed system is based on the Indian currency Coin Recognition. These techniques facilitate transaction making it essential factors in mind a system has been created which recognizes coin based on digital image processing. The coin recognition method using digital image processing which has an advantage over the conventional identification methods that is commonly used. Most of the coin testers in slot machines, work by testing physical properties of coins such as size, weight and materials. However, if physical similarities exist between coins of different currencies, then the traditional coin testers would fail to distinguish the different coins. Proposed System uses image processing solution. The System enables the technique to endorse Rotation Invariance for capturing both side coin images. Thus

comparison between the input object image and database image is performed.

4 BLOCK DIAGRAM:



3. Real time coin recognition system

DESCRIPTION:

As shown in the block diagram, the rotational assembly is used in which the coin is placed on a DC motor by using a crocodile clip. The camera is placed above the crocodile clip, which is used to capture the image. The motor will stop as soon as the coin comes at the center location of the camera. The camera captures both side images of the coin, and they are saved as database images using digital image processing techniques. The image of the coin captured by the camera is compared with the database image, and it will be recognized which coin it is. The LCD is used for displaying the message whether the motor is moving or stopped, and also it will display which coin it is, whether it is 1RS, 2RS, 5RS, 10RS. The LED bank is interfaced with the ATmega16 system. The LED is used to indicate which coin the camera is interfaced with MATLAB software as shown in the figure. Motor driver relay logic is used to make and break the contact according to logic 1 and logic 0. The control signal passed through the ATmega system to drive the motor is interfaced between the motor and ATmega16 system for capability system purpose. The crystal oscillator is used at internal frequency for the controller.

5 CAMERA:

We are using I-ball USB camera for image acquisition, following are some specifications of the camera.

I-Ball C8.0 Face2Face

- High Quality CMOS sensors.
- 8 M pixels still image resolution, 4 M pixels video resolution.
- High quality 5G wide angle lens.

- USB 2.0 Interface.
- 4x Digital zoom.
- Video Format: RGB 24 bit
- Video Resolution: 640x480, 1600x760, 1280x960, 1280x1024, 1600x1200, 2304x1728.

6 PCB LAYOUT:

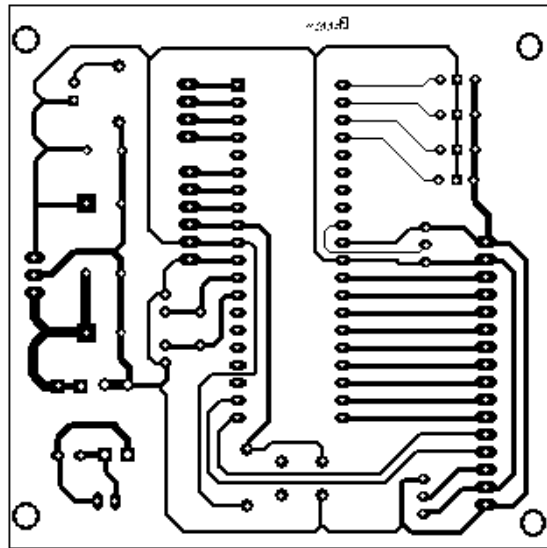
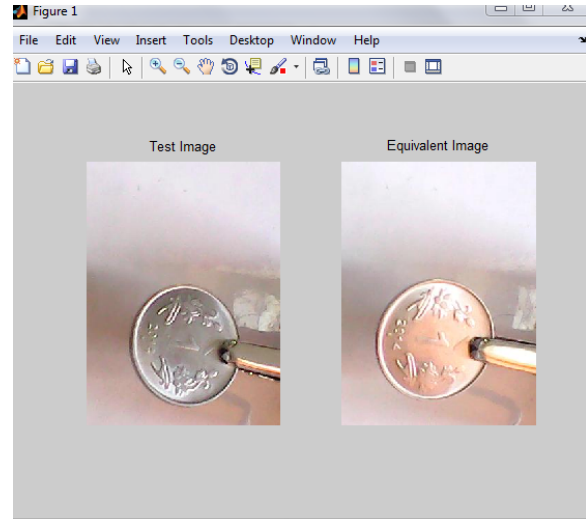
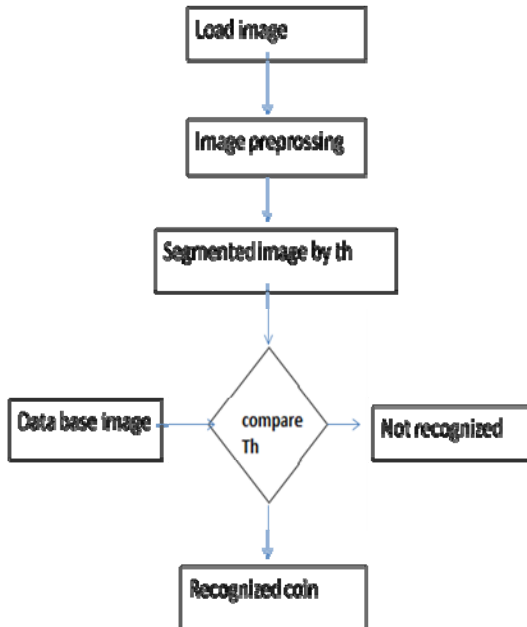


fig 5. PCB layout

7 FLOWCHART:



8 RESULTS TILL THE DATE

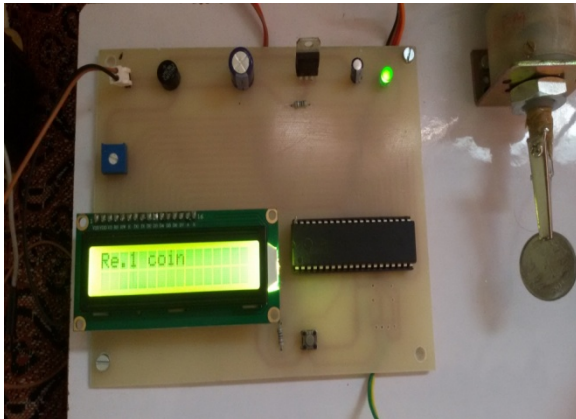


Fig5. Output

9 CONCLUSION :

Coin recognition using image subtraction shows positive signs for coin recognition. Image segmentation used as the first step which substantially reduces the amount of data to be dealt with, thus decreasing the processing time. Image subtraction provides Fast recognition with good accuracy provided the conditions are made standard. Also two subsequent checks are provided to give precise results. This solves a real life problem where physical similarities between these coins led to abusing slot machine. Future works will include modifications of the technique and also merging of other image processing techniques, such as, Neural Networks training using Edge detection which would extricate the process from the dependency over standard light Intensity and standard distance between coin and camera during image acquisition adding on to the accuracy of the process.

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