

## Intelligent Note to Coin Exchanger

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### Abstract

Shortage of coins in the daily transactions at bus stations, railway stations, shopping malls and park is the main requirement of implementing an efficient and simple machine which will accomplish need of coins for transactions so that people will not face the problem of shortage of coins. This proposed system will provide sufficient coins for respective note. To implement this system we have developed a model which can take the note inside and check whether the note is authentic or not by using camera. By using the image processing technique it will ascertain the value of note and then as per the value of note it will allot the coins. Through this method we are endeavoring to design a low budget and efficient machine as in contrast to other subsisting machines. To discover the value of note we have certainly designed the MATLAB criterion.

Keywords-Fake note detection, Coin allotting unit, notes, coins, servomotors.

### I. Introduction

Since coins make one's purse scarcely bulky most of people prefer to carry note instead of coins. Even the coins make noise, which makes one feel uncomfortable while carrying coins.

To tell the truth today people have transmuted their mentality about coins which is satisfactory. This is because holding a 10 rupee note is preferable than holding ten coins of particular rupee. Also coins are likely to make a whole lot of sound that can be aggravating for someone. Such people face problem when they go in the market. In our quotidian life people come across with the condition of not to get coins at sundry public places such as railway stations, malls, tour bus stations etc.



The primary scenario of robust and effective coin exchanger system is a machine to accept large denominations of currency and returns an equal amount of money in smaller bills or coins. Generally these machines are employed to provide coins in exchange for conventional paper currency. The system consists of 3 models: the input unit from where the note is accepted for processing, the processing unit which involve exploring the trueness of the currency and distinguishing between 10 rupee and 20 rupee note and inlayed part from where the denomination is provided to the customer.

### II. Literature Survey

Research Paper on: "A Study on Diverse Recognition Techniques for Indian Currency Note" [1]

In this, the recognition of paper currency is discussed. By using the toolbox of image processing the image is first processed by reducing dimensions and extracting the

feature i.e. known as feature extraction. Depending on the characteristics and extracting features of note the note recognition is done.

Research Paper on: "Note to Coin Exchanger Using Image Processing" [2]

To fulfill the need of coins for transactions by designing a simple and well-designed system is the main goal of this project. There are different method of identifying the Indian currency note namely, watermarking technique, texture based, pattern based, checking the micro lettering, color based recognition technique. Out of all these the most preferable technique is the color based recognition technique.

Research Paper on: "Note to Coin Exchanger with Fake Note Detection" [3]

The note is checked whether the note is original or duplicate. We have number of ways to determine whether the note is original or duplicate. We have used Ultraviolet rays in order to determine.

Research Paper on: "Indian Currency Note Denomination Recognition in Color Images" [4]

In this project, to detect the value of note a MATLAB algorithm is used for image binarization. Originality of note detection using UV LED and photodiode is discussed.

Research Paper on: "Overview of Currency Note to Coin Exchanger" [5]

By detecting the silver bromide thread that runs vertically through a currency note is the accurate way. The fake notes are mostly painted with the silver band color instead of silver threads. This provides a solution that will be convenient to obtain change in terms on coins in exchange of note. Also the system will be able to identify whether the note is genuine or fake.

### III. Objectives

The objectives of offered work are as employs:

1. To implement a well-designed system for fake note diagnosis.
2. To check whether the note is original or not.
3. To supply coins for the particular inserted note.
4. To prepare an algorithm to detect the value of note by using MATLAB.

5. To design a mechanical assembly that will provide the coins with respect to the provide note.

### IV. Methodology

To provide coins for the respective inserted not is the main motive of this project. In this system the microcontroller is used along with the mechanical composition in which the motors are used to perform the required tasks. In this system the note is inserted in the mechanical slot and then it checks whether the inserted note is original or fake. If the note is original the camera takes the snapshot of the particular note and with accompanied by a PC which includes MATLAB program checks the particular note value. When the note is acknowledged, coins are provided by coin allotting unit. The block diagram of our idea is shown. There are various wedges each performing different functions.

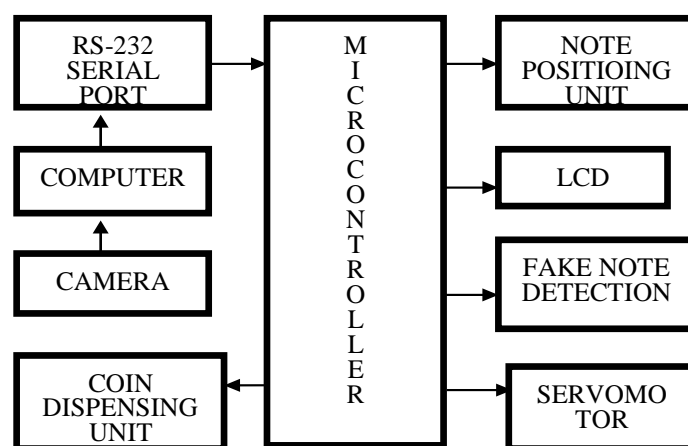


Fig 1. Block diagram of note to coin exchanger Note positioning unit:

This kind of unit involves drawer to set a note coin pile to maintain coin inside a machine Motor driver board. Three motors for coin dispensing of Rs 1, Rs 2 and Rs5. If coins are sufficient then electric motor rotates as per choice entered which dispenses the coins.

Keys:

Keys are basically used to provide the input to the microcontroller. These particular keys contain micro buttons which are attached to the microcontroller.

Liquid Crystal Display:

To display the output of the application the LCD is employed in this system. A 16x2 LCD type is used, in which 16 indicates the columns and 2 indicates series. That means one can enter 16 characters in first row and

total 32 characters can be displayed on 16x2 LCD. It can also be used in project to evaluate the output of different modules that are interfaced with the microcontroller.

#### Camera:

For making communication possible of computer with the microcontroller the RS232 standard can be used. The web camera for recognition is linked with the computer. Typically the MATLAB software window is used.

#### Servomotor:

Three servomotors are used in this project. Servomotor rotates approximately 180 degrees (90 in each direction). These motors are used for dispensing the coins.

#### Microcontroller:

Microcontroller controls the process of the system. To clarify the data from fake note detection unit and to check whether the currency is fake or real the microcontroller is used. Furthermore the microcontroller is used to control and synchronize the note feeding mechanism. To capture the image by giving instructions to PC and to interpret the information from PC this particular microcontroller is used.

#### PC:

For this system MATLAB is employed in PC. For image processing and to apply user interface PC is used. Using serial communication the microcontroller is connected to PC. For the acknowledgment of Indian currency the PCA technique is used in MATLAB.

#### Recognition and identification of note using image processing:

Different methods can be used like watermarking technique, structure base and pattern based, by looking at the micro letters, color based recognition technique and strip based technique for discovering the respective

Indian currency note. From all the above given techniques the commonly used technique is the recognition based on color method and the strip based technique. This technique is done by counting the pixels quantity of each color.

The global color distribution in an image is described in Histogram. Counting the quantity of pixels of particular color is done in to calculate the color histogram. The time complexity of computing color histogram is  $O(mn)$  for an image of resolution  $m*n$ . It is insensitive to small change.

#### Safety Features on Indian note

##### 1. Watermark:

There is a light and shade effect of watermark of Mahatma Gandhi on the series of banknote and even the multidirectional lines in the watermark window.

##### 2. Fluorescence:

The records of panel's quantity are printed with the inflorescent printer ink. The notes have optic fibers. All the records can be seen when they are exposed to the ultraviolet lamp.

##### 3. Micro letters:

Micro letters can be seen between the vertical band and Mahatma Gandhi symbol. These micro letters are nothing but the word 'RBI' in Rs.10 and in Rs '20' and also the denomination value can be seen in micro letters. This micro letters can be seen using a magnification glass.

##### 4. Latent Image:

There is a vertical strap on the Rs 1000, Rs 500, Rs 100, Rs 50, and Rs 20 notes on the right part of Gandhi's symbol that contains a latent image that shows the

## VI. Future Scope

denominational value in numeric form. As long as the note is held horizontally the latent image can be seen at vision level.

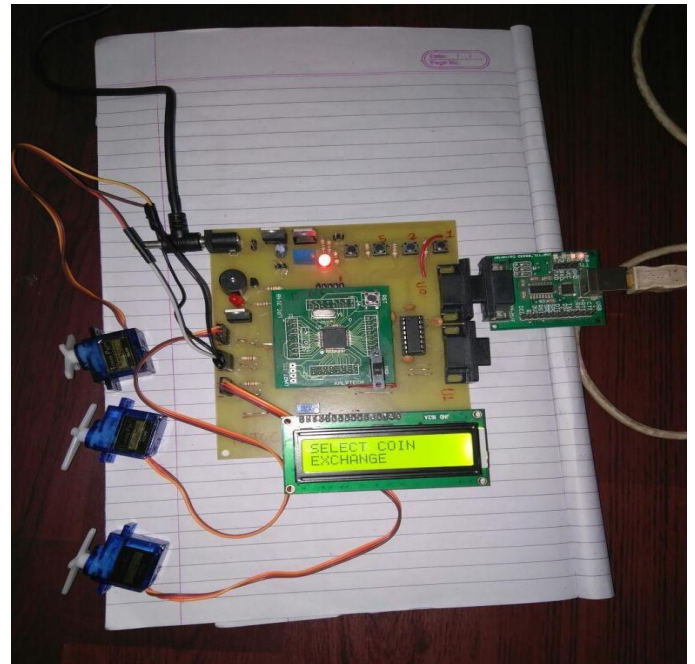
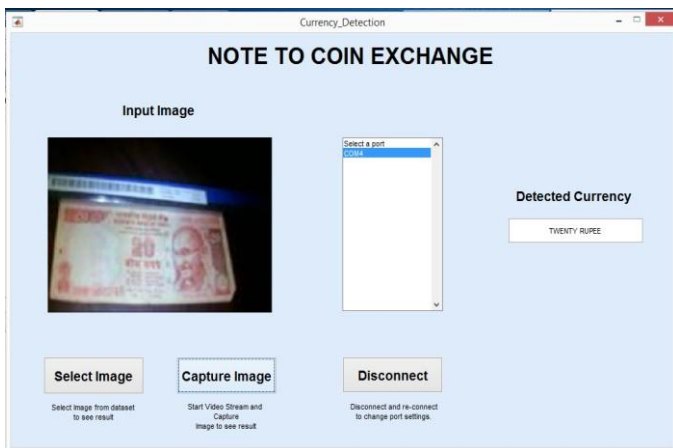
5 A string of serial numbers:

It is important to evaluate that whether the note is repeated or wrong, because every banknote has its own dram on number.

## V. Result:



Fig 2. 10 Rs note value detection.



1. We can extend the capacity of note and coin up to 100 Rs in future.
2. It can be used to exchange the currency of other countries.

## VII.

### onclusion

Color centered recognition techniques are used in this project. This project can identify the original and fake note very flawlessly and is very precise. This system will be very useful for common people at public places to get a change of coins. It is a real time application project which is user friendly. Currency recognition using localization and color recognition with the help of MATLAB is done to develop an interactive system.

## VIII. REFERENCE

- [1] K. A. Gavali, S. D. Patil, D. D. Ingavle, "NOTE TO Fig 3. 20 Rs note value detection. COIN EXCHANGER".
- [2] T. A. Walunj, G. A. Mote, S. M. Roman, "OVERVIEW OF CURRENCY NOTE TO COIN EXCHANGER".
- [3] D. A. Sable, M. D. Bagde, "ROBUST AND EFFECTIVE NOTE TO COIN EXCHANGER WITH FAKE NOTE DETECTION".
- [4] V. U. Kale, D. R. Dandge, "INTELLIGENT NOTE TO COIN EXCHANGER".

- [5] P. Soor, S. Agate, G. Deshpande, "INTELLIGENT NOTE TO COIN EXCHANGER WITH FAKE NOTE DETECTION". COMPUTING AND COMMUNICATION".
- [6] Mirza, R., and Nanda," PAPER CURRENCY VERIFICATION SYSTEM BASED ON CHARACTERISTIC EXTRACTION USING IMAGE PROCESSING".
- [7] V. K. Jain, Dr. Ritu, "INTERNATIONAL JOURNAL OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGIES".

- [8]Chakraborty, K., Basumatary, J., Dasgupta, D., Kalita, J.C., and Mukherjee, "RECENT DEVELOPMENTS IN PAPER CURRENCY RECOGNITION SYSTEM".
- [9]Pawade, D., Chaudhari, P., Sonkamble, "COMPARATIVE STUDY OF DIFFERENT PAPER CURRENCY AND COIN CURRENCY RECOGNITION METHOD".
- [10] A. Bade, D. Aher, "INTERNATIONAL JOURNAL ON RECENT AND INNOVATION TRENDS IN