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Coin Based Mobile Charging System

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Abstract--The main objective of our project is to charge a mobile by inserting the coin and also providing locking of valuable things. As the user inserts a coin the coin will be detected by its edge and size of coin, by detecting its edges we can prevent confusion between different coins. Then accordingly the options will be given through which the user can select according to its needs. If the charger is selected then the power will be given according to the amount of coin inserted and the if the locker is selected the motor will be driven and opens the locker and by the face of the user it will be locked and unlocked.

I. INTRODUCTION

The growth of mobile phone is phenomenal in recent years; therefore the need of charging can be at any place at any time both in urban and rural areas. And as we know, nowadays the mobile requires charging frequently even twice or thrice in a day. Therefore, it is very much necessary of the charging slot or charging system when the people are outside of home. Therefore, this system can be implemented in public places like railway station, hotels, etc. When we are travelling nowadays as we know that our thing which we carry with ourselves is not safe. Therefore, our project also provides the facility for safety purpose as it contains the locker system in which we can put our luggage and many valuable things. The locker will be operated by the fingerprint of the user so that things will be fully secure.

In our project the coin will be detected by its respective area and size and the locker will be driven by the motor. The time period for which the charging will be predetermined and the locker will be operated on the basis of the fingerprints. According to the need and selection of the user the facility will be provided by the system. Recommended locations includes: Hotels, conference centers, exhibition halls, serviced offices, exchange halls, motels, leisure centers, health clubs, training centers, golf clubs, retail outlets, shopping malls, Internet cafes, universities, colleges, hall of residences, airports, train terminals, etc so that the mobile phone user can reactivate a low or dead battery by simply plugging in and charging.

II. RELATED WORK

The small amount of charge can be used in the idle phase to reduce the long charging time without pushing reliability limits of the batteries. This DPCS technique effectively decreases longer charging time hence provides an efficient alternative battery charging system. In this method, after applying a constant current for a short amount of time (e.g., a few seconds), the system rests for a few tens of a millisecond to let ions and chemicals to settle and stabilize. This technique can be utilized in future mobile, wireless charging and power transfer systems. [I]

This paper focuses on the acoustic method, in which coin recognition is based on the detection of the coin's natural frequencies. The frequencies of these vibrations depend on the object's properties (mass, shape, material type), and remain the same as long as these properties do not change, thus being used as acoustic fingerprints. Also, this method permits recognition of fake or deteriorated coins, because they have different properties. The principle applied in this paper can be used for the recognition of numerical sequences produced by other. [II]

The type of coin and the size will be displayed at the LCD display for the user so as to ensure correct coin insertion. Any other coin, if inserted in the slot will be returned to refund box. A sensor attached to the coin insertion slot accepts the coin into the battery charging unit and start charging the mobile battery for a specific period controlled by the software of the microcontroller. The sensor is an IR sensor. The resistance of the sensor decreases when IR (infrared) light falls on it. Coin accepted or rejected is based on the diameter of the coin. When the routine completes, it indicates charge complete message through LCD display. [III]

An intelligent coin identification system (ICIS) is proposed. ICIS uses a neutral network and pattern averaging to recognize rotated coins at various degrees. Methods for coin identification were suggested, such as the use of coin surface color and the use of edge detection of coin patterns and also through its pixels an overall correct identification result of 96.3% has been achieved, where 77 out of 80, variably rotated coin images, were correctly identified. These results are very encouraging when considering the time costs. [IV]

III. SYSTEM BLOCK DIAGRAM

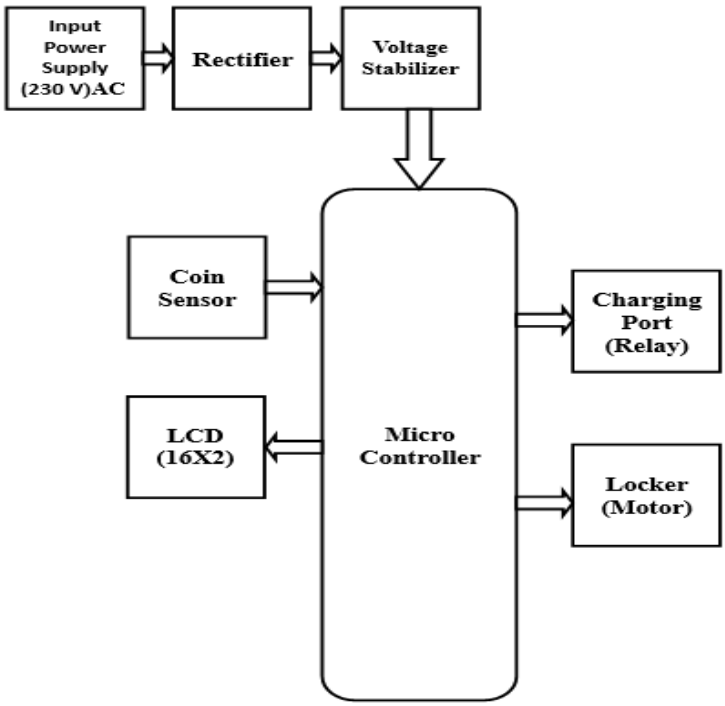

Figure 1: System Block Diagram

Firstly, we will give input to the system by inserting a coin, that will go to the coin sensor which senses the coin and the system will prompt the services: as a charging port and as a locker, then according to the need of the user, the user will select. A battery charger, or recharger, is a device used to put energy into a secondary cell or rechargeable charging by forcing an electric current through it.

The charging protocol depends on the size and type of the battery being charged. Some battery types have high tolerance for overcharging and can be recharged by connection to a constant voltage source or a constant current source; simple chargers of this type require manual disconnection at the end of the charge cycle, or may have a timer to cut off charging current at a fixed time. Other battery types cannot withstand long high-rate over-charging; the charger may have temperature or voltage sensing circuits and a microprocessor controller to adjust the charging current, determine the state of charge, and cut off at the end of charge.

IV. FLOWCHART

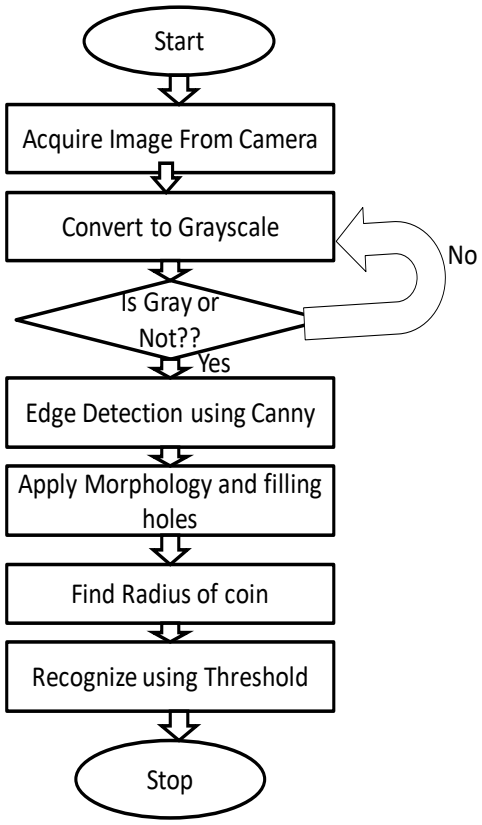

Figure 2: Flowchart

Step 1: Firstly, the images will be acquired by the camera which will be fixed at some particular angle.
Step 2: Then the images will be converted from rgb to gray scale for further process.
Step 3: Then it will be checked whether it is converted to gray scale or not, if not it will go back to step 2.
Step 4: Further, the edge detection will be done by the canny method.
Step 5: After that, the morphological operation will be done on the image which is converted into grayscale.
Step 6: Then, the radius will be found and we will get its respective threshold value.

5.1 Edge Detection Methods

Edge detection is an image processing technique for finding the boundaries of objects within images. It works by detecting discontinuities in brightness. Edge detection is used for image segmentation and data extraction in areas such as image processing, computer vision, and machine vision.
Common edge detection algorithms include Sobel, Canny, Prewitt, Roberts, and fuzzy logic methods and etc.

[I] Sobel: The Sobel method of edge detection for image segmentation finds edges using the Sobel approximation to the derivative. It precedes the edges at those points where the gradient is highest. The Sobel technique performs a 2-D spatial gradient quantity on an image and so highlights regions of high spatial frequency that correspond to edges. In general it is used to find the estimated absolute gradient magnitude at each point in n input grayscale image.

[II] Canny: The Canny edge detection technique is one of the standard edge detection techniques. To find edges by separating noise from the image before find edges of image the Canny is a very important method. Canny method is a better method without disturbing the features of the edges in the image afterwards it applying the tendency to find the edges and the serious value for threshold.

[III] Prewitt: To estimate the magnitude and orientation of an edge Prewitt is a correct way. Even though different gradient edge detection wants a quite time consuming calculation to estimate the direction from the magnitudes in the x and y-

directions, the compass edge detection obtains the direction directly from the kernel with the highest response. It is limited to 8 possible directions; however knowledge shows that most direct direction estimates are not much more perfect.

V. SIMULATION RESULTS

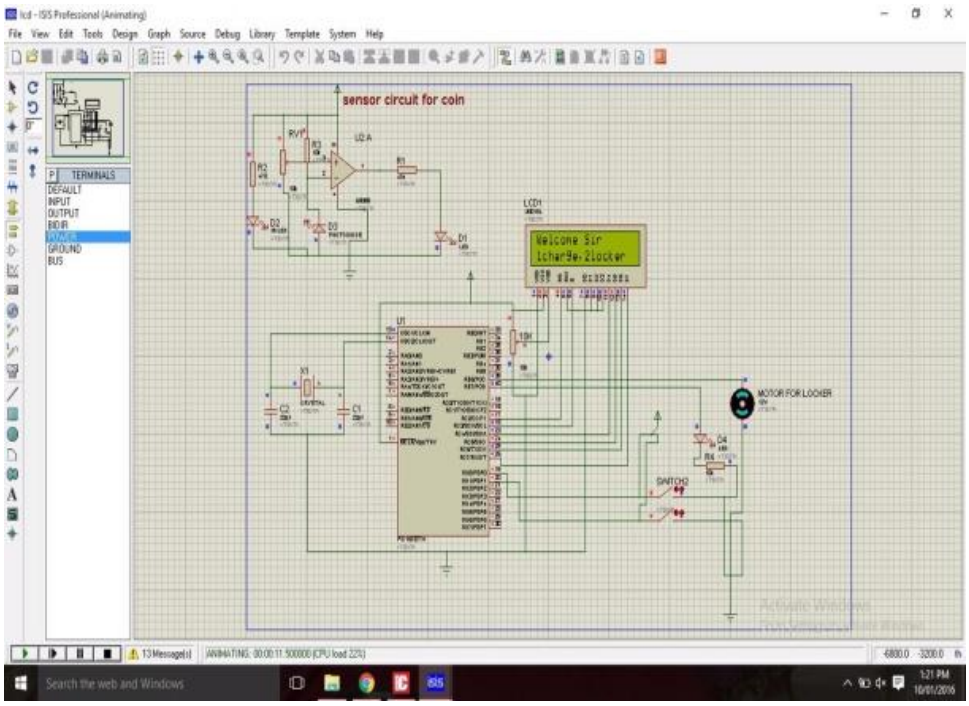

Figure 3: Proteus Running

In the above figure it is shown the circuit of coin sensor and interfacing of 16*2 lcd with motor which drives the locker, we had taken the PIC 16F887 microcontroller

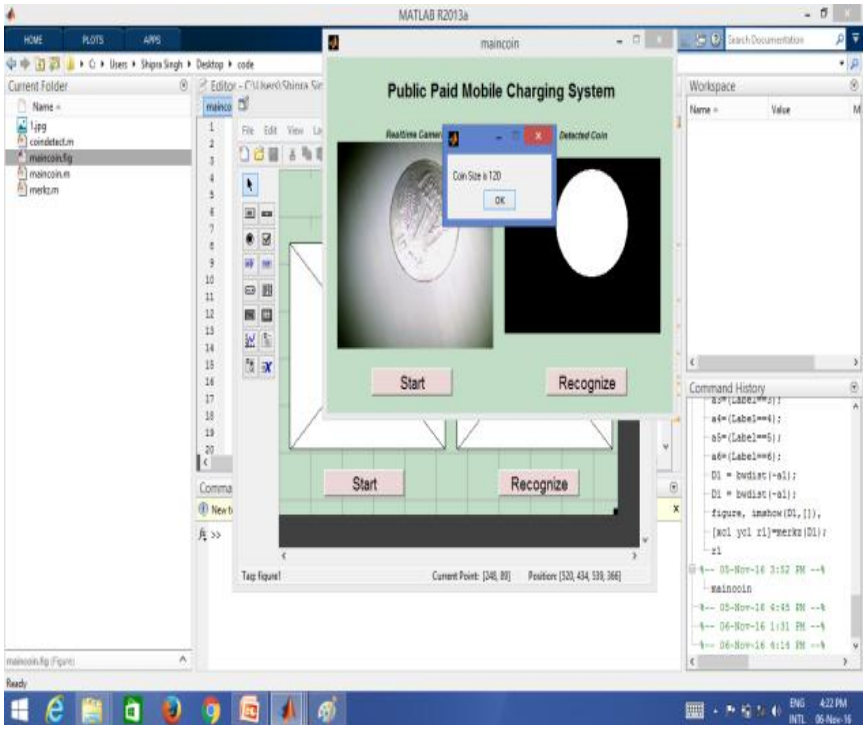

Figure 4: MATLAB Coin Detection

In the above there is shown the simulation of coin sensor in MATLAB, here we had made recognized the coin with its edges and dimensions by using canny method.

CONCLUSION

Here we had modeled the "paid public mobile charging system". The main aim of our project is to make the judicious use of power at required places, generate the revenue which we can use further in maintenance of our system and also avoiding the rush. Our project senses the coin and accordingly provide the amount of power to the user for the charging the mobile locker facility.

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