

RFID and MATLAB Based Attendance Monitoring Using laptop or web Camera to Capture Images with Date and Time

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Abstract- The project aims at structuring an intelligent security system for account the attendance in colleges, firms etc... The proposed system makes use of RFID technology for recording the attendance. The system captures images of students and saves the participation alongside enter and exit date and time. The Intelligent system proposed makes use of both Embedded and MATLAB to achieve the task.

I. INTRODUCTION

The face plays a very important role in our social interaction, conveyance of title people's identity.

[1] Exploitation the face as a key to security, confront acknowledgment innovation has received important attention within the past many years thanks to its potential for a good style of applications in each social control authorization and non-law implementation. A facial affirmation structure is a PC application for naturally perceiving or checking a man from a computerized picture or a video layout from a video source. [1] One of the ways to deal with do this is by differentiating picked facial features from the image and a facial database. It is commonly utilized in security frameworks.

II. LITERATURE SURVEY

Normally in schools and colleges, the average student's count will be 50-80. Teacher has to mark student's presence for every hour. [1] Traditionally, student's group actions area unit taken manually by mistreatment attendance sheet given by the college members at school, that could betime overwhelming event. Moreover, it's terribly tough to verify one by one student inavery massive schoolroom atmosphere with distributed branches whether or not the documented students are literally responding or not. [2] Mistreatment typical technique of vocation out names takes around 5-10 minutes for marking group action of entire category. for marking attendance of entire class.[3] It becomes complicated when strength is more. To overcome the traditional method, an automatic RFID based participation framework came into existence.

III. EXISTING SYSTEM

Existing system for taking Attendance for Students are either biometric or Iris recognition system.[1] Both are high in cost and also to keep up these frameworks is also difficult. There may be chance of making fake attendance by manipulating the system. The students can be place their fingers for attendance and can go out without entering into class.[3] There will be issues in detecting finger prints because of glass placed on the sensor.

IV. PROPOSED SYSTEM

The proposed system is to capture the images of students and it will be store into the computer along with student's entry and exit time using MATLAB software. The main disadvantages in Existing systems are they can be give attendance to the students irrespective of staying in class. To overcome this problem we proposed this system. The system Gets input from RFID reader and send data to microcontroller. The microcontroller sends this information to MATLAB through RS232 communication to capture images. MATLAB will be run in computer and when it gets information from microcontroller it will on the Camera of the system and catches the picture of student along with Date and time. It will also have the feature of Lecturer Entry and Exit. When the lecturer enters into class he will shows his tag then Attendance of understudies who were most certainly not entered before lecturer will be off until Lecturer Exit tag shown. The system can capable of showing students attendance count on LCD i.e., how many students are entered into class before lecturer enters into class. If there is any invalid tag shown by student then automatically an alarm sound will be generated by piezo electric buzzer. Different operations being performed can be seen through LCD display. A total number of students will be displayed on alphanumeric display. The Microcontroller is loaded with intelligent program written in embedded 'C' language.

V. HARDWARE DESCRIPTION

A. Micro controller-



Fig.1: Microcontrollers

Conditions that we asset in today in the field of microcontrollers had their beginnings in the advancement of innovation of integrated circuits. This advancement has made it available to store countless transistors into one chip. That was an essential for generation of microchips, and the first PCs were made by including outer peripherals, for example, memory, input-output lines, clocks and other. Additionally expanding of the volume of the bundle brought about making of coordinated circuits. These incorporated circuits consist of both processor and peripherals. That is the manner by which the main chip contains a microcomputer, or what may later be known as a microcontroller.

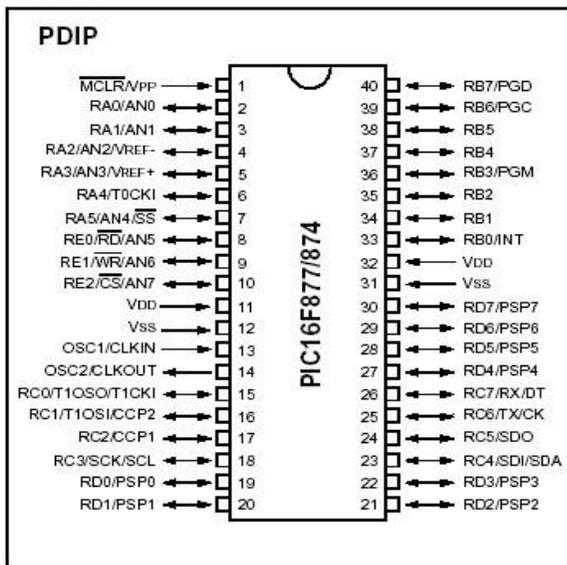


Fig.2: Pin diagram if PIC16F877A

Pic16f877 is a 40 pin microcontroller. It has 5 ports port A, port B, port C, port D, port E. All the pins of the ports are for interfacing input output devices.

Port A: It comprises of 6 pins from A0 to A5

Port B: It comprises of 8 pins from B0 to B7

Port C: It comprises of 8 pins from C0 to C7

Port D: It comprises of 8 pins from D0 to D7

Port E: It comprises of 3 pins from E0 to E2

Whatever is left of the pins are required pins these ought not to be utilized to interface input-output devices.

Pin 1 is MCLR (Master clear pin). This pin also referred as reset pin.

Pin 13, 14 are utilized for precious stone oscillator to interface with produce a frequency around 20MHz.

Pin 11, 12 and 31, 32 are utilized for voltage supply Vdd(+) and Vss(-)

B. RFID-

RFID utilizes a semiconductor (micro-chip) in a tag or name to exchange put away information when the tag or mark is presented to radio rushes of the right recurrence. RFID systems fundamentally consist of four elements:

- 1) The RFID tags.
- 2) The RFID readers
- 3) The receiving wires and decision of radio attributes,
- 4) The PC arrange (assuming any) that is utilized to interface the readers.

RFID Tags-

The tag is the fundamental building square of RFID. Each label comprises of a receiving wire and a little silicon chip which has a radio beneficiary, a radio modulator for exchanging a reaction back to the per user, control rationale, some measure of memory, and a power framework. The power framework can be totally fueled by the approaching RF motion, in which case the tag is known as an inactive tag. Alternatively, the label's capacity framework can have a battery, in which case the tag is known as a functioning tag.



Fig.3: RFID tag inner view

RFID tag format-



C. Readers

The RFID reader sends a beat of radio vitality to the tag and tunes in for the label's reaction. The tag recognizes this vitality and sends back a reaction that contains the label's sequential number and perhaps other data also. In basic RFID frameworks, the reader's beat of vitality worked as an on-off switch; in more modern frameworks, the reader's RF flag can contain directions to the tag, guidelines to peruse or compose memory that the tag contains, and even passwords. Truly, RFID readers were intended to peruse just a specific sort of tag, yet supposed multimode readers that can peruse a wide range of sorts of labels are ending up progressively prominent. RFID readers are as a general rule on, perseveringly transmitting radio essentialness and envisioning any marks that enter their field of undertaking.

Band Frequency, Wavelength, and Classical Usage

Band	Unlicensed Frequency	Wavelength	Classical Use
LF	125–134.2KHz	2,400 meters	Animal tagging and keyless entry
HF	13.56MHz	22 meters	
UHF	865.5–867.6MHz (Europe) 915MHz (U.S.) 950–956MHz (Japan)	32.8 centimeters	Smart cards, logistics, and item management
ISM	2.4GHz	12.5 centimeters	Item management

Table.1: Frequency table

D. Lcd Display-

A champion among the most outstanding contraptions associated with a littler scale controller is a LCD appears. The absolute most regular LCD's associated with the various microcontrollers are 16x2 and 20x2 presentations. This infers 16 characters for each line by 2 lines and 20 characters for each line by 2 lines, independently.

LCD Pin diagram-
LCD

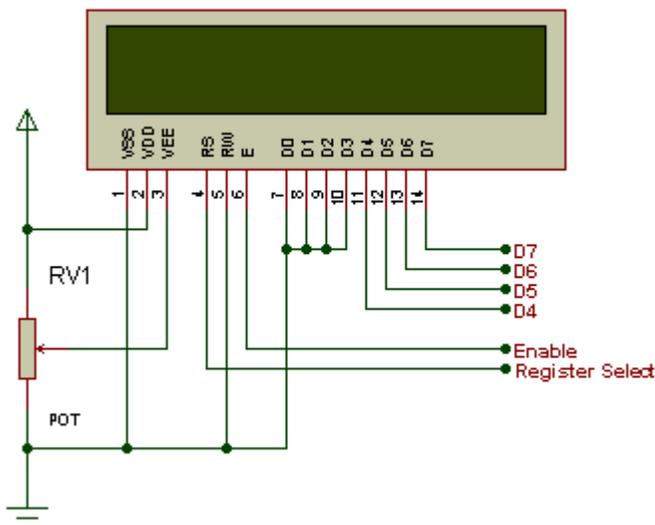


Fig.4: LCD pins description

The LCD requires 3 control lines and additionally either 4 or 8 I/O lines for the information transport. The client may choose whether the LCD is to work with a 4-bit data transport or a 8-bit information transport. On the off chance that a 4-bit information transport is utilized the LCD will require a sum of 7 information lines (3 control lines in addition to the 4 lines for the information transport). In the event that a 8-bit information transport is utilized the LCD will require a sum of 11 data lines (3 control lines in addition to the 8 lines for the information transport). The three control lines are insinuated as EN, RS, and RW.

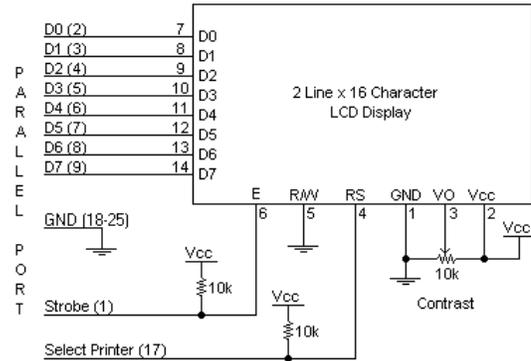


Fig.5: Schematic of 16*2 LCD display

E. Buzzer-

A buzzer or beeper is a sound flagging gadget, which might be mechanical, electromechanical, or piezoelectric. Normal employments of bells and beepers incorporate caution gadgets, clocks and affirmation of client information, for example, a mouse click or keystroke.



Fig.6: picture of buzzer

F. Project Images-

The below image is taken when we give power supply to the microcontroller the microcontroller is waiting to detect the RFID tag, the information is displaying on the LCD that means the microcontroller is ready to take input from tags. We need to wait until the microcontroller shows this message on LCD screen.



Fig.7: checking for input

After showing the RFID tag the microcontroller shows the Tag number on LCD screen to verify that the card number is correct or not.



Fig.8: Showing Tag number

The details of students are as of now put away in microcontroller. When the student shows his/her tag then if the tag is valid the student's name and roll number will be displayed on LCD screen.

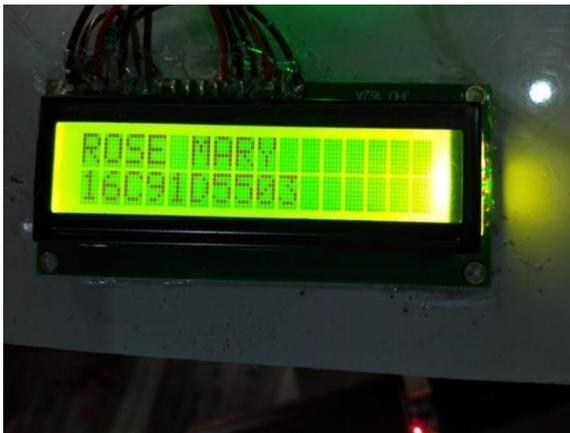


Fig.9: Showing student details

As we discussed when the lecturer shows his tag then automatically the microcontroller displays the number of students entered into class before lecturer comes.

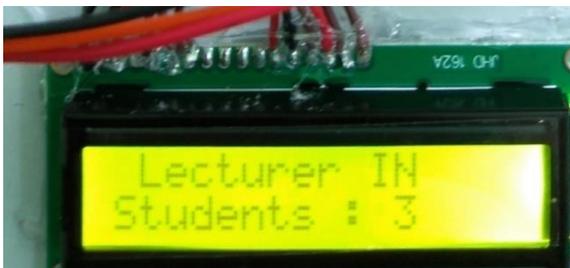


Fig.10: Showing lecturer entry and attendees

When any student is showing his own purchased tag then the data of that tag is not stored in Microcontroller. So the microcontroller displays an Invalid message and also an buzzer alarm can be hear in the circuit.



Fig.11: Showing unknown tag

In the below image we can see the Hardware components of this project.

- 1) Transformer
- 2) Mother board along with Microcontroller and Power supply section
- 3) RFID reader
- 4) LCD display

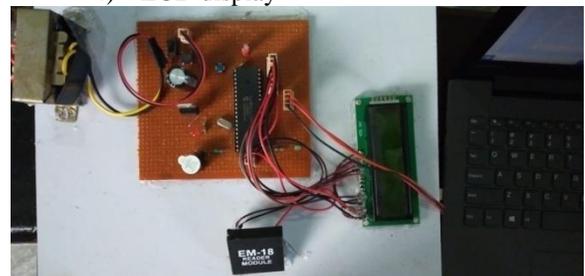


Fig.12: Experimental setup

VI. RESULT

The system was successfully implemented to capture images of students and stores them with date and time. And also Shows students count on 16*2 LCD display.

VII. CONCLUSION AND FUTURE WORK

This framework is executed and tried effectively. Coordinating highlights of all the equipment parts utilized have been produced in it. Nearness of each module has been implemented carefully, thus adding to the best working of the unit. Besides, utilizing extreme working IC's with the assistance of developing automation, the venture has been effectively completed. Consequently the undertaking has been effectively structured and tried.

This task can be extended by utilizing face recognition feature, and operating system as the additional security and also can be reached out to send the total attendance directly to the server of college by placing Raspberry pi microprocessor.

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