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Biometric based quorum implementation using LabVIEW and GSM

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Abstract : Quorum (Attendance) is one of the work ethics which is valued by most employers. In educational institutions also, attendance and academic success are directly associated. Therefore, right attendance management systems must be in vicinity. Most of the educational institutions and government agencies in growing countries still use paper based attendance method to monitor the attendance. Fingerprint based totally automated identity gadget based are gaining popularity due to unique nature of fingerprints. Using the fingerprints we can get each and every element of any individual. Through this, the records acquired can be used in many applications along with Airport Security System, Voting System, and Employee login System, in locating the thieves etc. We in our undertaking have implemented in attendance System. A unique software program called SFG is used right here to keep finger prints for further use. In this we use the additives which include GSM (sim900A). The coding here is in accomplished in a Graphical Programming language named LabVIEW in which the execution of any application is carried out in a sequential manner or little by little in keeping with the records acquired.

Keywords: Biometrics, Fingerprint module, LabVIEW, GSM.

I . INTRODUCTION

The term biometrics has been derived from Greek roots “bios” meaning existence and “metrics” that means dimension. Biometric era uniquely identifies an individual primarily based on certain characteristics which can be physiological or behavioural. There are in particular nine biometric techniques which can be widely used inclusive of face, fingerprint, hand vein, hand geometry, iris, retinal sample, voice print, signature and facial thermograms[1]. These strategies use records that is particular to the individual and remains so during one’s lifetime. Fingerprints are rising because the maximum popular biometrics technology because of its uniqueness, stability, permanence and simplicity of acquisition.

Presently in most of the instructional institutes, the attendance of college students is taken via traditional method wherein instructor calls the number and marks his attendance. There are disadvantages to this approach which includes paper based attendance registers aren't uploaded to any centralised gadget consequently the information isn't available for evaluation, effective lecture time receives affected due to the time taken for statistics series and the machine also can be cheated with the aid of college students. Biometrics technology can remedy these problems and proposed fingerprint based attendance gadget might be best for implementation in universities for identification and also via organizations for attendance monitoring in their personnel. Proposed device is designed using Lab View and GSM module.

Attendance Management falls into two classes specifically: Conventional and Automated techniques. Conventional strategies consist of time sheet, attendance check in and time clock. Time sheets are files, electronic or in any other case that record what time became spent by means of the employee on what duties. Attendance check in is an authentic list of individuals who are present at an institution or employer. Automated methods consist of Barcode device attendance machine, magnetic stripe attendance machine, Radio Frequency Identification (RFID) and the biometric attendance system.

In biometric Attendance system, there is attendance software this is paired with a time clock for personnel which makes use of biometric generation for authentication functions. Other advantages consist of elimination of the cost previously incurred in getting the employees cards.

Paper is prepared as follows. Section II affords a assessment of work carried out inside the area of biometric attendance systems. Proposed fingerprint attendance machine using LabVIEW and GSM is described with its block diagram, running and software design in Section III. Testing of the machine and consequences are mentioned in Section IV. Finally end is presented in Section V.

II. METHODOLOGY

FINGERPRINT verification is one of the oldest recognized biometric strategies regarded however still the maximum extensively used because of its simplicity and exact data of accuracy. The fingerprint popularity and verification approach has been followed to replace the traditional method as it saves time and eliminates all of the set-backs diagnosed with the attendance sign in publication. A fingerprint detecting device is to be located in places such that college students might be required to swipe their finger across the sensor in order to indicate their presence. The scholar facts are stored within the database for verification. The Fingerprint technology serves as an identification evidence to take the attendance of students. The device reads fingerprint and verifies this records with the already stored sample in its database.

If the information is matched with the saved fingerprint,
the gadget acknowledges the attendance.

In this biometric attendance system we are interfacing finger print sensor and GSM module with Lab VIEW.

The process algorithm is shown in figure

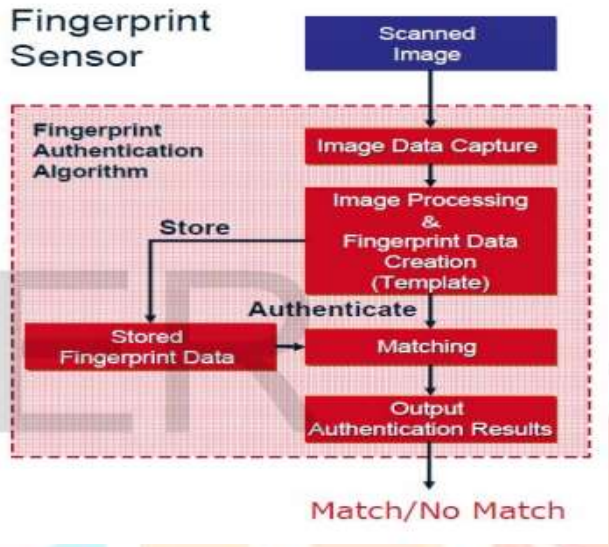

Fig.2: Fingerprint sensor algorithm

System description :

This device is composed two components. A part of the machine is taking attendance by the use of fingerprints of college students and storing statistics to SD card with textual content file and sending message after extracting absence from SD card. Another one is storing the attendance via SD card and calculating the percentage of attendance.

Hardware used :

1. FINGERPRINT SENSOR
2. USB TO RS232 CONVERTERS
3. GSM MODULE

Fingerprint Sensor :

R307 Fingerprint Module includes optical fingerprint sensor, high-velocity DSP processor, excessive-performance fingerprint alignment algorithm, high-potential FLASH chips and other hardware and software program composition, solid overall performance, easy shape, with fingerprint access, photograph processing, fingerprint matching, search and template garage and different functions.

Fig 3.2: fingerprint sensor

Interface Description:
The R307 fingerprint module has interface TTL UART and USB2.0, USB2.0 interface can be connected to the computer; RS232 interface is a TTL stage, the default baud rate is 57600 , can be modified. Needs to attach the laptop level conversion, degree conversion word, embodiments inclusive of a MAX232 circuit.
1. 5V - Regulated 5V DC

2. GND - Common Ground

3. TXD - Data output - Connect to MCU RX

4. RXD - Data Input - Connect to MCU TX

5. TOUCH - Touch on sensor by finger when there

6. 3.3V - Use 3.3V to sensor instead of 5V

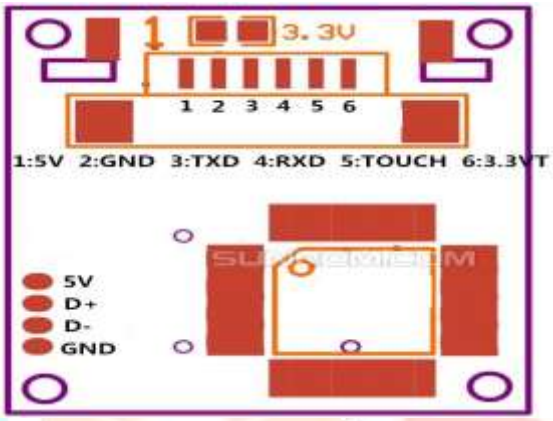

Fig 3.2.1: Floor placement fingerprint sensor [R307]

USB TO RS232 Converters :
TX: Transmit from the USB-SER board. It is a Serial Output and generally related to the RX pin on any microcontroller or equivalent UART.
RX: Receive into the USB-SER board. It is a Serial Input and typically related to the TX pin on any microcontroller or equivalent UART.
+5V: is connected to USB 5V bus thru filter ferrite bead. It can range from 4.0 - 5.0 V relying on the regulation of the given USB port. In USB 2.0 device, this pin can offer a maximum of 500mA according with the USB 2.0 specification.
GND: is a not unusual floor for each pin. This pin need to be connected to ground while the use of external strength supply on the goal board.

Fig : USB TO Rs232 Converter

GSM Module:
GSM is a cellular verbal exchange modem; it stands for global system for mobile communication (GSM). The idea of GSM changed into advanced at Bell Laboratories in 1970. GSM is an open and virtual cellular era used for transmitting mobile voice and records services operates on the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.The virtual machine has an potential to carry sixty four kbps to one hundred twenty Mbps of records prices.

Software used:

NI LabVIEW 16.0:

LabVIEW (Labortaory virtual instrument engineering workbench) is a graphical programming languages (C, Pascal) and some elements of hardware definition languages (VHDL, Verilog). Namely, it combines the generality and strength of conventional programming records structures inclusive of loops, if-then branches, and arithmetic operators with the capacity of hardware definition languages to perform a couple of tasks simultaneously.

Lab VIEW Program Structure:

A LabVIEW program is similar to a textual content-based totally application with functions and subroutines.
A LabVIEW VI has 3 important components:

- **Front Panel window**

Every person created VI has a front panel that contains the graphical interface with which a person interacts. The front panel can house various graphical objects ranging from simple buttons to complicated graphs.

- **Block Diagram window**

It contains the graphical source code of lab View program. The concept of block diagram is to separate the graphical source code from the user interface in a logical and simple manner. Front panel objects appear as terminals on block diagram.

- **Control Pane**

Lab View is a user interface that uses controls and indicators. Controls allow the user to give input or control data while indicators serve as a way to output or indicate data, graphics and information.

SFG Demo:

It is used to scan and store finger prints for further use.

Fig : SFG Demo

III. WORKING

We will first design a code in Lab View for successfully running of finger print attendance system.
Initially fingerprints are stored using templates with the help of SFG Demo software.
Once the code is run on LabVIEW it displays SFG Demo software to place finger on finger print sensor. After scanning of finger print the code checks for matching of placed finger with the templates already stored. If finger is matched then attendance is recorded and the attendance of particular member or student is updated in the excel sheet and if student is absent then a message will reach parents mobile by making use of GSM module along with a SIM inserted in it.(refer fig a)

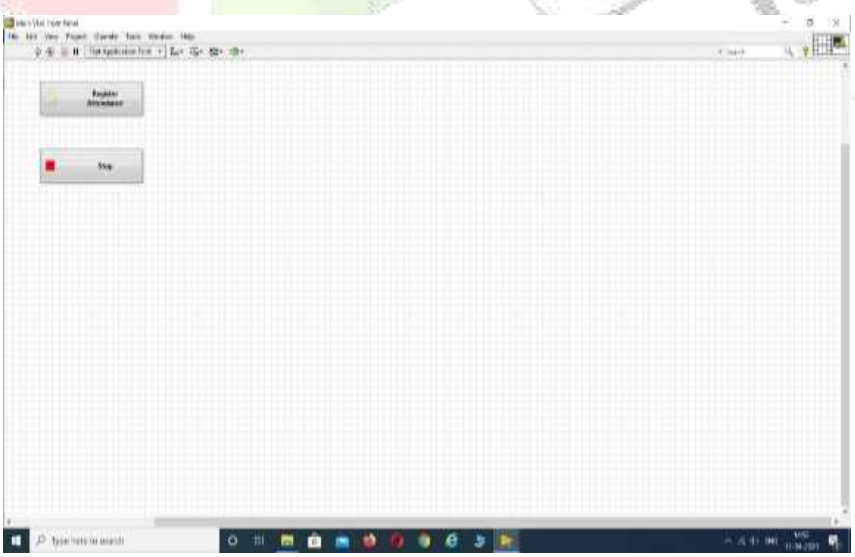

Fig a: Front panel

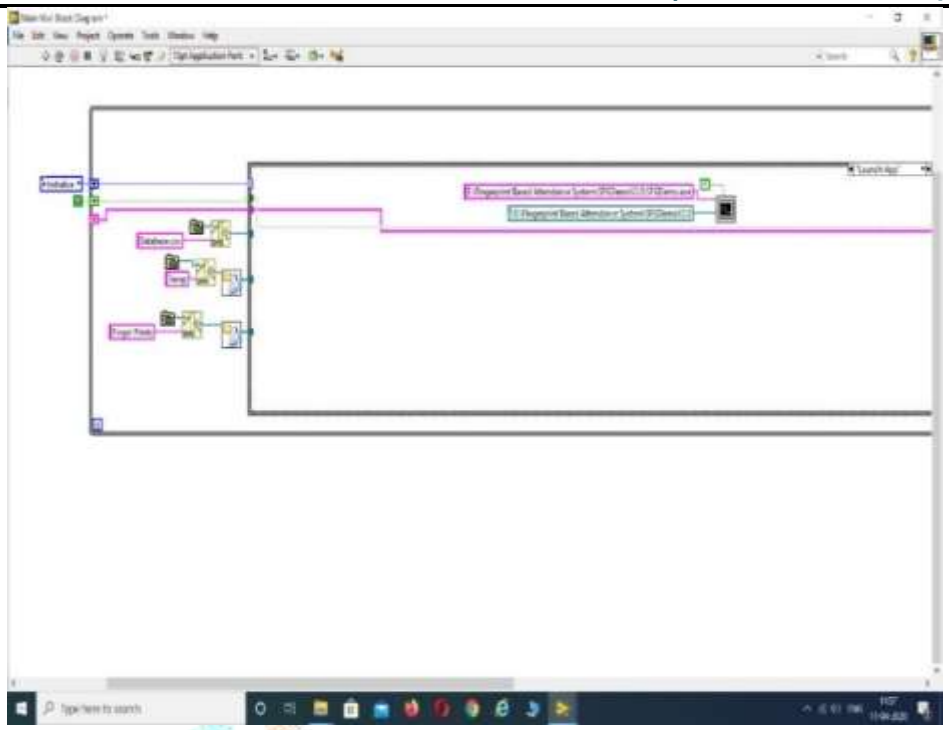

Fig b : Block diagram

IV. EXPERIMETAL RESULTS

Below is the excel sheet where student attendance is registered. And message will be sent to parents if their ward is absent.

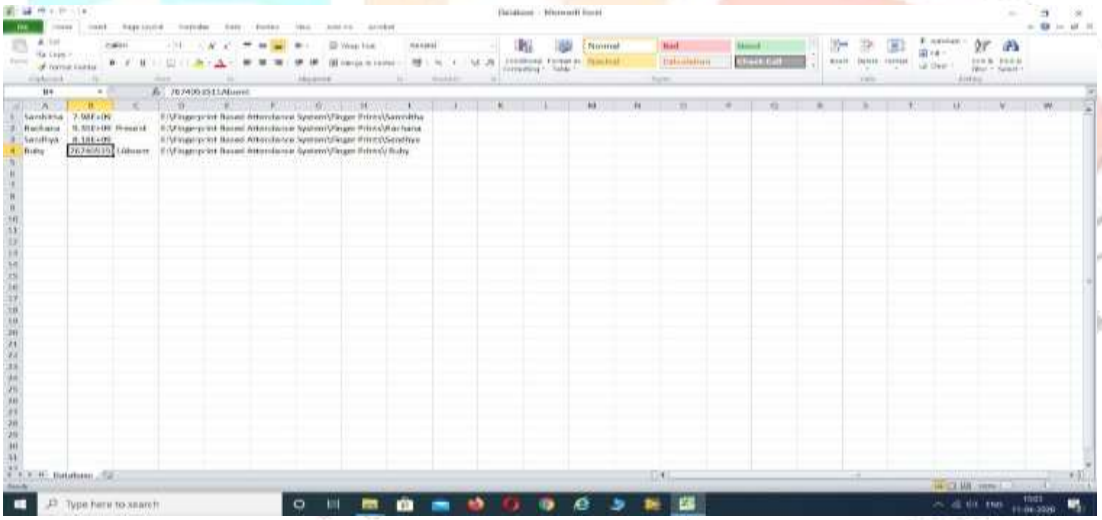

Fig : Result

V. CONCLUSION

Biometric generation is an efficient tool to detect fraud and confirm identity and. The prototype of fingerprint based totally attendance gadget using LabVIEW and GSM machine is applied. It affords a simple and price powerful approach of attendance monitoring in corporations and academic establishments as compared to conventional methods of attendance control.

Future Scope :

1. It can also be used in airport security gadget, worker statistics acquisition.

2.This challenge may be carried out as a cell utility wherein-in overall protection is supplied.

3. Memory of finger print module can be improved .We can use a 1mb flash reminiscence finger print module for growing the ability.

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