Blood Donor Identification System For Locating Potential Donors In Hospital Premises

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Abstract— The purpose of this project is to develop the blood donor identification system for identifying potential donors in hospital premises. Blood donor information is maintained in the hospital database where it can be used to identify the donors in emergency situation. The database contains patient name, patient blood group, patient phone number, address, age, etc., Using RF ID or fingerprint sensor the entry of the person is registered using in-punch system. Based on certain specifications right numbers of donor are sorted out for different blood groups. Sorting of donors is based on criteria such as blood group, hemoglobin level in blood and last donated date. Whenever there is an emergency situation, donor within the hospital with a specific blood group is sent with a requisition message for blood donation with the help of GSM module. Message is sent only for the appropriate donors within the hospital premises

I. INTRODUCTION

There is no other redeeming act than to save a human life. Blood is the fuel of life. In India, blood is required for every 2 seconds. But, people feel afraid or selfish when it comes to donating blood. If everybody thinks that way, there will be no blood available in the blood banks then doctors may be unable to save human lives. People who have never donated blood may themselves require blood at some point of their life. It may happen to anyone. If human lives are wasted because of the death of blood in the blood banks it will be a embarrassment to the human society. So don't be afraid or selfish about donating blood. More awareness should be created about blood donation, so that more and more people will come forward to donate blood. So donate blood and encourage other people as well..

With number of blood requirement increasing everyday it has became increasingly important for the hospitals to find out the right number of donors. The main part lies in identifying donor with minimum time. In case of a rare blood group, it is very difficult to find the donors and it becomes very hard in emergency situation which even may cost someone's life.

II. RELATED WORK

In our project, it is possible to find the donors in the hospital zone with the help of the in-punch system. In-punch system can be made with the help of RF-ID or fingerprint sensor. Prior to that, donor information should be collected and fed with the system. Whenever a person enters into the hospital, the person's arrival is encountered with the help of finger print sensor and the respective person is counted as in. The person's name will be added into the particular blood group list with the help of controller and the data is maintained until he is out of the hospital. When there is a blood requirement in the hospital, using the filter, a message is sent to the particular donor group with the use of GSM module there by the accessing time of the donors can be reduced. If the person fails to respond he/she can be called with the number present in the detail which is stored in the hospital database.

It is necessary to maintain two sets to database. One is permanent and another one is temporary database. Permanent database contains details of all the donors irrespective of the location of the donors where as the temporary holds information about person present only within the hospital range.

For example if 'O'+ve blood is required, by pushing the appropriate push button in the system, system checks for number of donors entered in the

hospital having the required blood group. The donors are sorted based on the last blood donated date, age and also hemoglobin level their blood. And finally those donors are sent with the message "Emergency! Your blood is required in the hospital where you are now, please report to the blood bank soon."

III. HARDWARE PART

A. Finger Print Sensor

The GT-511C3 FPS (fingerprint scanner) is a small embedded module that consists of an optical sensor mounted on a small circuit board. The optical sensor scans a fingerprint and the microcontroller and software provides the modules functionality which automatically processes the scanned fingerprint.

The interface of the FPS is very basic consisting of only four pins – power, ground, serial transmit and serial receive.

The module itself does all of the heavy lifting behind reading and identifying the fingerprints with an on-board optical sensor and 32-bit CPU. All we need to do is send it simple commands. To get started, we have to register each fingerprint that we want to store by sending the corresponding command and pressing the finger against the reader three times. The fingerprint scanner can store different fingerprints and the database of prints can even be downloaded from the unit and distributed to other modules. As well as the fingerprint "template," the analyzed version of the print, we can also retrieve the image of a fingerprint and even pull raw images from the optical sensor.

Pin configuration:

The fingerprint sensor which we have chosen has only four pins. The description of each pin is given below.

Pins 1 and 2 are 3.3V TTL pins used to communicate with the FPS module. The default baud rate is 9600bps after power on.

Pin 1 is the transmit pin of the UART on the FPS (UART Tx) and transmits a logic high of up to a maximum of 3.3V.

Pin 2 is the receive pin of the UART on the FPS (UART Rx) and can receive a logic high level of up to 3.3V. The voltage level sent to this pin from a microcontroller needs to be reduced when working with 5V microcontrollers.

Pin 3 is the common GND or 0V pin of the FPS module.

Pin 4 is the 5V input to the FPS module used to power it. This value can be between 4.5V and 6V.

B. Arduino Microcontroller:

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.
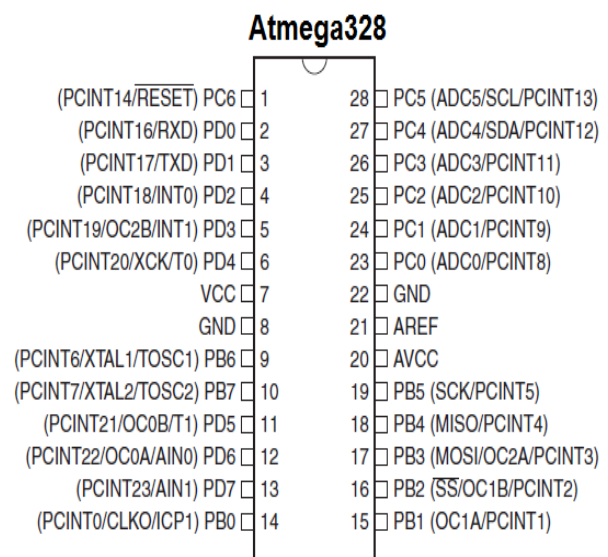
Arduino is an open-source physical computing platform based on a simple i/o board and a development environment that implements the Processing/Wiring language. Arduino can be used to develop stand-alone interactive objects or can be connected to software on computer (e.g. Flash, Processing, MaxMSP).

The Uno R3 also adds SDA and SCL pins next to the AREF. In addition, there are two new pins placed near the RESET pin. One is the IOREF that allow the shields to adapt to the voltage provided from the board.

C. GSM Module:

The GSM stands for Global System for Mobile communications. This is a global standard which is followed by the GSM modules inside the cellular phones which enables them to be connected with any mobile network around the globe. In certain applications the microcontroller based systems has to be connected with the GSM network which will enable a user to control the system by sending messages or making a call. The systems can also send messages to the user to alert or inform about the status of the system running.

In all cases a separate GSM module is used rather than using the mobile phones. The advantage of using a GSM communication with a system or device is that the user can control the system wirelessly no matter how far it is kept compared to any other wireless communication, provided that both the user and the device should be in a cellular coverage area.

Featuring an industry-standard interface, the SIM900A delivers GSM/GPRS 900/1800MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption.

Wiring of FPS:

As FPS RX and TX are supposed to accept 3.3V and Arduino deliver 5V on pins, we have to add a divider with 2 resistors (1k and 560) on FPS RX. FPS TX cable is the black one.

To connect FPS with Arduino:

Testing FPS connection making the backlight blink. Store in internal database some finger prints. Try to compare a finger print with stored ones.

Very donor specific fingerprint identified and transferred with the help of the black cable mentioned in the circuit.
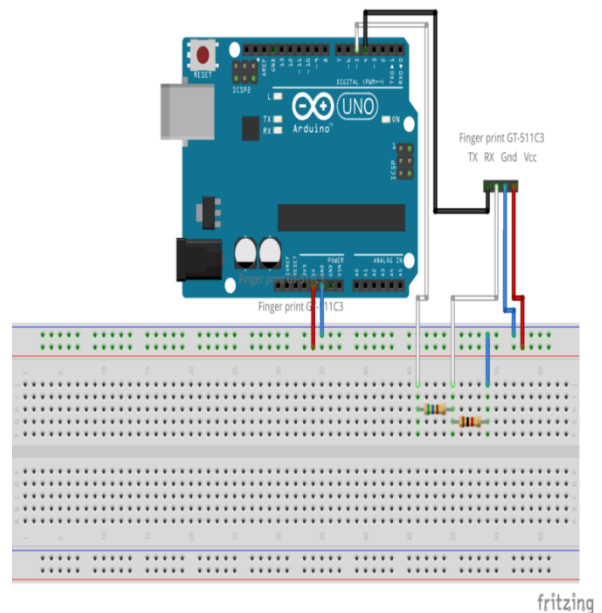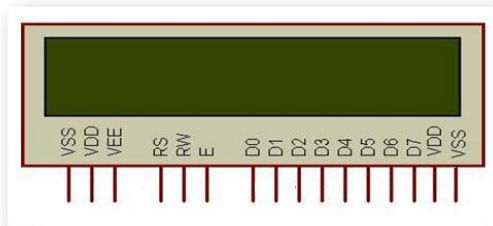

Inter connection of Arduino with GSM module:

The SIM900A module has 6pins in which two pins for Vcc and Gnd and the rest are 3VR&3VT (3volt Rx &Tx) and 5VR, 5VT(5volt Rx &Tx).
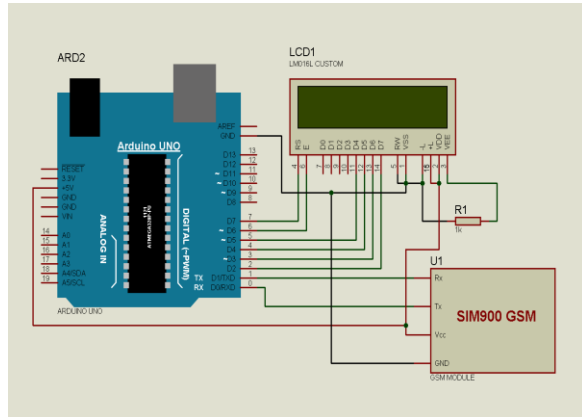
D.LCD display

A liquid-crystal display (LCD) is a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals.

Liquid crystals do not emit light directly.[1] LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays, as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

III.SOFTWARE PART

Embedded C:

Embedded C is a programming is the soul of the processor functioning inside our embedded system. Arduino associated with the embedded software called embedded C. It includes all the functionalities of the embedded system. The C code written here is more reliable, scalable, portable and in fact, much easier to understand. The conversion of from the FPS to the database and database to GSM module is done with the help of embedded C code.

Finger print conversion code can be build easily with the embedded C comparing with other embedded software and several codes are built with the features available with the software.

My SQL:

MySQL is an open source relational database management system that uses Structured Query Language. SQL is the most popular language for adding, accessing and maintain content in a database. It is most noted for its quick processing, ease and flexibility of use. In our system creating and maintaining the database is a critical task and it is done with the MySQL database. Both permanent and temporary database is designed with the same software.

For filtering and sorting right number of donors with criteria mentioned in our project, MySQL is the best available database.

IV.PROBLEM STATEMENT

The need of blood in emergency situations is confined to time and the problems lies in identifying donors.Thetraditionl methods used in emergency situations are approaching blood banks in various multi speciality hospitals and spreading messages through social medias.Though these methods have helped a lot in emergency Situations, but there is always a gap between demand and donors.

V.SOLUTION TO THE PROBLEM

The device that has been made consists of Arduino Microcontroller, Finger print sensor, GPS Module, LCD display, Push button switch. The person whoever entering into hospital has to in punch by placing his/her finger in the finger print sensor. Then the blood group of the particular person and his/her detail is temporarily stored under the particular blood group in the server. Once the push of button of any blood group is pressed the the emergency message is will be sent to the persons.

VI.BLOCK DIAGRAM
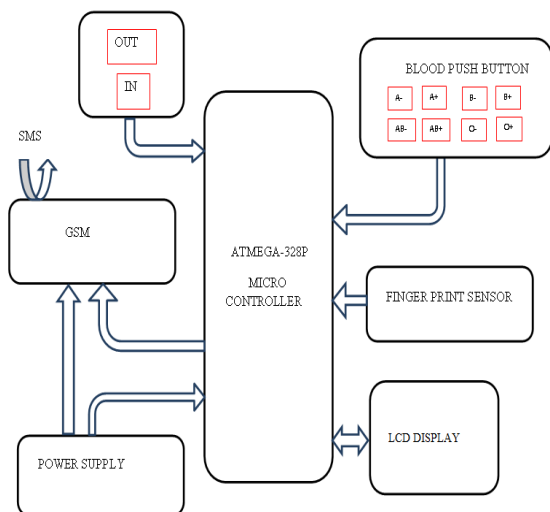
We use Atmegamicrocontroller, finger print sensor, power supply ,GSM module,LCDdisplay,power supply and Push buttons.The power supply is used to supply 12V to the circuit.LCD display is used to denote the current person entering into the hospital.

The person whoever entering into hospital has to inpunch by placing his/her finger in the finger print sensor. Then the blood group of the particular person and his/her detail is temporarily stored under the particular blood group in the server.

Once the push of button of any blood group is pressed then the microcontroller gets the details from the server and it is further processed and given to GSM module. Then an emergency message will be sent to the mobile number of the persons.

VII.OUTPUT

The details of the person who entering in the hospitals are collected and stored permanently in the server.Once he/she enters the hospital his/her detail is temporarily stored under the particular blood group.Once the push button of a particular blood group is pressed the details of the persons inside the hospital will be displayed in the LCD screen and an emergency message will be sent to their mobile phones.

VIII.CONCLUSION

This project covers the most required features which could be an important aspect in emergency situation. The fingerprint sensor which is used is of highly sensitive and it is very suitable to real time application. The smartness of the system can be well utilized by increasing the number of donor registration .The blood availability is made much easier with this system in order to save the human life.

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