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Secure Electronic Voting Machine with Finger Print Based Biometric System

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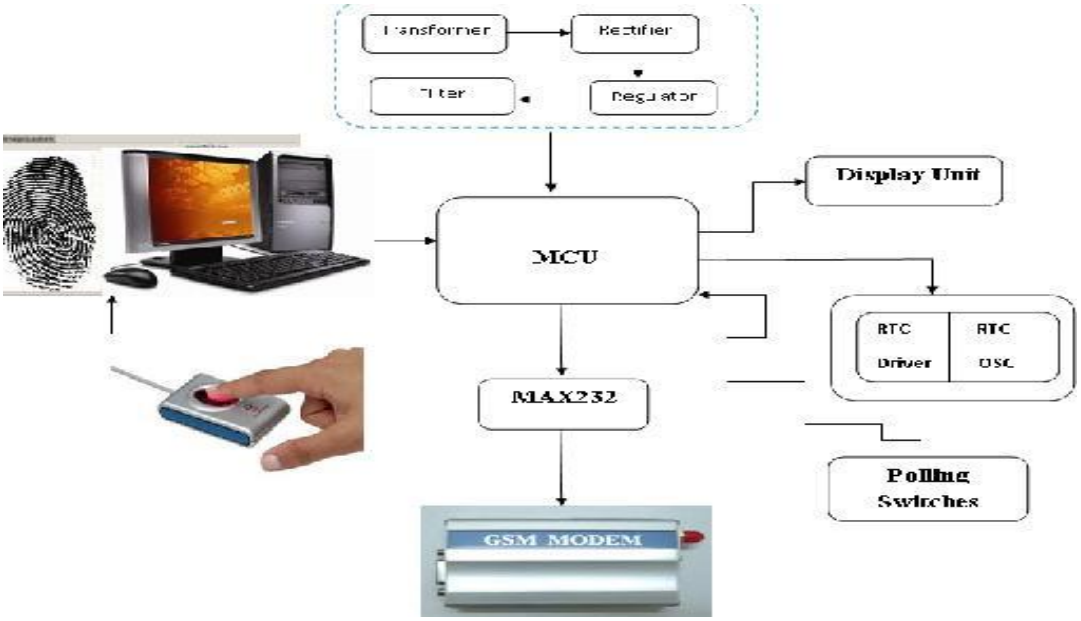
Abstract— Electronic voting mean for (e-voting) and it casting votes and counting votes electronically. This technology used for punch cards, optical scan voting systems, Direct-recording electronic (DRE) voting systems and private computers as well as internet. Electronic voting systems have much more advantages compared to other voting techniques. An electronic voting technology can speed the counting of ballots and can provide improved accessibility for disabled voters. The main aim of this project is develop a secure and very fast to display the results as well as human comfort.
Keywords— e- voting, DRE, counting ballots

I. INTRODUCTION

E-voting has been a very controversial topic ever since the presidential elections in the U.S. in 2000.Many security flaws were found . the standards for the implementation of e-voting systems were shown to be too weak and many. India is world's largest democracy. It is perceived to be charismatic one as it accommodates cultural, regional, economical, social disparities and still is able to stand on its own. Fundamental right to vote or simply voting in elections forms the basis of Indian democracy. In India all earlier elections be it state elections or centre elections a voter used to cast his/her vote to his/her favourite candidate by putting the stamp against his/her name and then folding the ballot paper as per a prescribed method before putting it in the Ballot box. This is a long, time-consuming process and very much prone to errors. This situation continued till election scene was completely changed by electronic voting machine. No more ballot paper, ballot boxes, stamping, etc. all this condensed into a simple box called ballot unit of the electronic voting machine. EVM is capable of saving considerable printing stationery and transport of large volumes of electoral material. It is easy to transport, store, and maintain. It completely rules out the chance of invalid votes. Its use results in reduction of polling time, resulting in fewer problems in electoral preparations, law and order, candidates' expenditure, etc. and easy and accurate counting without any mischief at the counting centre. It is also eco friendly. There are two different forms of voting: distance and presence voting . In presence voting, a voter can cast his or her vote in a polling station under the supervision of the election's administration.

II. BLOCK DIAGRAM



Fingerprint Module

III. OPERATION PRINCIPLE

Fingerprint processing includes two parts: fingerprint enrolment and fingerprint matching (the matching can be 1:1 or 1:N).When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1:N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure.

IV. EXISTING SYSTEM

The system allows the Evil Practices held in the manual Voting system. Electronic voting systems may offer advantages compared to other voting techniques. An electronic voting system can be involved in any one of a number of steps in the setup, distributing, voting, collecting, and counting of ballots, and thus may or may not introduce advantages into any of these steps.

V. PROPOSED SYSTEM

Electronic voting (also known as e-voting) is a term encompassing several different types of voting, embracing both electronic means of casting a vote and electronic means of counting votes. It can also involve transmission of ballots and votes via telephones, private computer networks, or the Internet

VI. WORKING PRINCIPLE

The AC voltage, typically 220V r m s, is connected to a transformer, which steps that ac voltage down to the level of the desired DC output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes.

VII. TRANSFORMER

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op–amp.

A. Hardware Connection

Via serial interface, the Module may communicate with MCU of 3.3V or 5V power. TD connects with RXD (receiving pin of

MCU), RD connects with TXD (transferring pin of MCU). Should the upper computer (PC) be in RS-232 mode, add level converting circuit, like MAX232, between the Module and PC.

B. Serial Communication Protocol

The mode is semi duplex synchronism serial communication. And the default baud rate is 57600bps. User may set the baud rate in 9600～115200b.The system sets aside a 512-bytes memory (16 pages* 32 bytes) for user's notepad, where data requiring power-off protection can be stored. The host can access the page by instructions of PS Write Notepad and PS Read Notepad.
Note: when write on one page of the pad, the entire 32 bytes will be written in wholly covering the original contents.

C. Buffer

There are an image buffer and two 512-byte-character-file buffer within the RAM space of the module. Users can read & write any of the buffers by instructions.
Note: Contents of the above buffers will be lost at power-off.

D. Image Buffer

Image Buffer serves for image storage and the image format is 256*288 pixels. When transferring through UART, to quicken speed, only the upper 4 bits of the pixel is transferred (that is 16 grey degrees). And two adjacent pixels of the same row will form a byte before the transferring. When uploaded to PC, the 16-grey-degree image will be extended to 256-grey-degree format. That's 8-bit BMP format. When transferring through USB, the image is 8-bit pixel, that's 256 grey degrees.

E. Fingerprint Library

System sets aside a certain space within Flash for fingerprint template storage, that's fingerprint library. Contents of the library remain at power off. Capacity of the library changes with the capacity of Flash, system will recognize the latter automatically. Fingerprint template's storage in Flash is in sequential order. Assume the fingerprint capacity N, then the serial number of template in library is 0, 1, 2, 3 … N. User can only access library by template number.

F. System Configuration Parameter

To facilitate user's developing, Module opens part system parameters for use. And the basic instructions are Set Sys Para & Read Sys Para. Both instructions take Parameter Number as parameter. When upper computer sends command to modify parameter, Module first responses with original configurations, then performs the parameter modification and writes configuration record into Flash. At the next start up, system will run with the new configurations.

G. Baud Rate Control

The Parameter controls the UART communication speed of the Module. Its value is an integer
N, N= [1, 12]. Corresponding baud rate is 9600*N bps

H. Security Level

The Parameter controls the matching threshold value of fingerprint searching and matching.
Security level is divided into 5 grades, and corresponding value is 1, 2, 3, 4, and 5. At level 1, FAR is the highest and FRR is the lowest; however at level 5, FAR is the lowest and FRR is the highest.

I. Module Password

At power-on reset, system first checks whether the handshaking password has been modified. If not, system deems upper computer has no requirement of verifying password and will enter into normal operation mode. That's, when Module password remains the default, verifying process can be jumped. The password length is 4 bytes, and its default factory value is 0FFH, 0FFH, 0FFH, 0FF.

VIII. CONCLUSION

Fingerprint Based Voting Machine is designed to make the procedure of voting easier and more convenient as it is a modified system. It has proved to be very advantageous in providing security EVM is capable of saving considerable printing stationery and transport of large volumes of electoral material. It is easy to transport, store, and maintain. It completely rules out the chance of invalid votes. In total, the complete system (including all the hardware components and software routines) is working

as per the initial specifications and requirements of our project. So certain aspects of the system can be modified as operational experience is gained with it. As the users work with the system, they develop various new ideas for the development and enhancement of the project. The proposed system has been designed and implemented successfully using a PIC microcontroller, which was shown to be superior over the existing Electronic Voting Machine. The proposed system has the benefit of using a biometric authentication and control the process of voting avoiding unnecessary things like rigging, ballot papers, casings etc.

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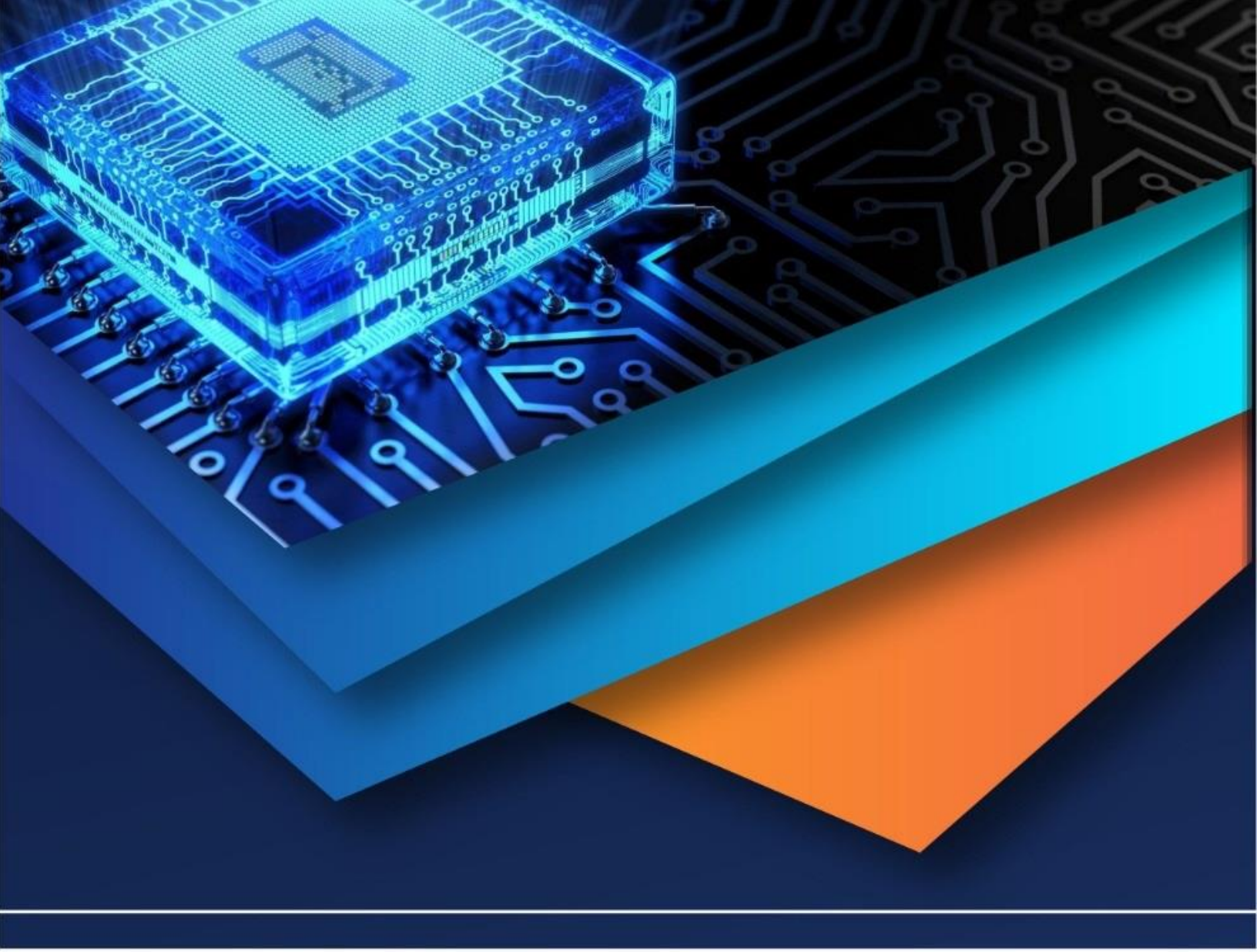

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