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Development of Fingerprint based high Security Voting System

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Abstract— In the current scenario, most of the countries of the world hold their elections using Electronic Voting Machines, where your vote gets registered electronically with the help of an Electronic Machine without using and wasting ballot paper to vote for elections. The domain of the project is the Internet of Things where we are building Fingerprint Based Biometric Voting Machine using Arduino. We know that IoT is the system of interrelated computing devices, mechanical and digital machines, objects, and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.
Thus our Fingerprint online module is an application where the user is recognized by his finger pattern. As we know that the a finger of each human being are different, the voter can be easily authenticated. The online system allows the voter to vote through his fingerprint. Once the user has got the voters id and password from the admin the user can log in and vote for the candidates who were nominated. The system will allow the user to vote for only one candidate. In the end, the election result is published by using the election id. Even users can view the election result.

Keywords— Watermark, Discrete wavelet Transformation (DWT), Singular Value Decomposition(SVD),2D Barcode,Steganography

I. INTRODUCTION

Biometric Finger print devices are used in the Electronic Voting machine for voter verification. We have designed a finger print based voting machine where there is no need for the user to carry his ID which contains his required details. The person at the polling booth needs only to place his Finger on the device, thus allowing the acquisition of an on-spot fingerprint from the voter which serves as an identification. This Finger print reader reads the details from the tag. This data is passed onto the controlling unit for the verification. The controller fetches the data from the reader and compares this data with the already existing data stored during the registration of the voters. If the data matches with the pre-stored information of the registered fingerprint, the person is allowed to cast his vote. If not, a warning message is displayed on LCD and the person is barred from polling his vote. The vote casting mechanism is carried out manually using the push buttons. LCD is used to display the related messages, warnings and ensuing results.

Also using wifi module the information is transfer to the Server platform. Wi-Fi (Short for Wireless Fidelity) is a wireless technology that uses radio frequency to transmit data through the air. Wi-Fi has initial speeds of 1mbps to 2mbps. Wi-Fi transmits data in the frequency band of 2.4 GHz. It implements the concept of frequency division multiplexing technology. Range of Wi-Fi technology is 40-300 feet.

The main controlling part of the project is ARDUINO micro controller. The Microcontroller is programmed using Embedded C language.

II. EMBEDDED SYSTEMS

An embedded system is a computer system designed to perform one or a few dedicated functions often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical

parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today.

In general, "embedded system" is not a strictly definable term, as most systems have some element of extensibility or programmability. For example, handheld computers share some elements with embedded systems such as the operating systems and microprocessors which power them, but they allow different applications to be loaded and peripherals to be connected. Moreover, even systems which don't expose programmability as a primary feature generally need to support software updates. On a continuum from "general purpose" to "embedded", large application systems will have subcomponents at most points even if the system as a whole is "designed to perform one or a few dedicated functions", and is thus appropriate to call "embedded". A modern example of embedded system is shown in fig: 1.

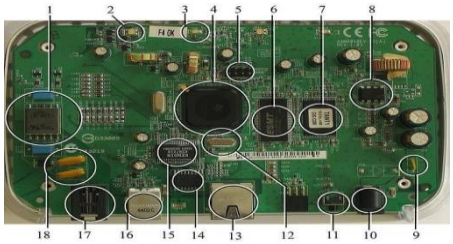

Fig 1:A modern example of embedded system

III. METHODOLOGY

Step 1: Parts
Arduino IDE installed
on your PCStep 2: The
Approach
We use the Arduino UNO to bootload the ATmega328 that is sitting on the Arduino-on-a-Breadboard.

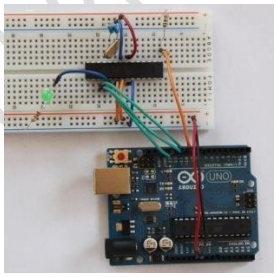

Fig 2: Arduino-on-a-Breadboard

Step 3: Program your Arduino UNO as an ISP

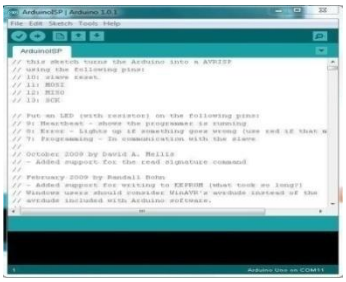

Fig 3: Arduino Program

We need to program the Arduino UNO to act as an ISP (In-System Programmer), so that it can burn the bootloader onto the Breadboard chip.

1. Open the Arduino IDE
2. Open the ArduinoISP sketch (under File, Examples)
3. If you're using version 1.0 of the IDE:
   Search for *void heartbeat* and change the line that reads:

Connect your UNO to the PC, making sure it's not connected to the Arduino on a Breadboard.
Ensure your UNO is selected under the Boards menu option, and upload the sketch.
Step 4: Connect your ATmega328
Now connect your ATmega to your UNO as follows:

- UNO 5v ---> ATmega pin 7 (VCC)
- UNO GND ---> ATmega pin 8 (GND)
- UNO pin 10 ---> ATmega pin 1 (RESET)
- UNO pin 11 ---> ATmega pin 17 (MOSI)
- UNO pin 12 ---> ATmega pin 18 (MISO)
- UNO pin 13 ---> ATmega pin

19 (SCK) Step 5: Which ATmega328 are you using?

I learnt the hard way that there is more than one type of ATmega328. The two variants that are of interestto us are the ATmega328-PU and the ATmega328P-PU.

The **-PU** suffix means that the chips are in a PDIP package, the format we need for our breadboard. The **328P** is a picoPower processor, designed for low power consumption, and is used on the Arduino boards. Given low power consumption this is first choice.

Step 6: ATmega328-PU workaround

Fig 4: Compilation of Program

In your Arduino folder, find the subfolder: ..*hardware**tools**avr**etc*

1. Make a backup copy of the file: *avrdude.conf*
2. Open the file *avrdude.conf* in a text editor
3. Search for: "*0x1e 0x95 0x0F*" (this is the ATmega328P signature)
4. Replace it with: "*0x1e 0x95 0x14*" (this is the ATmega328 signature)
5. Save the file

6. Restart the Arduino IDE
7. Continue with the rest of the steps in the instructable, and once bootloading is complete restore the backup copy you made.

Step 7: Bootload the ATmega328

Fig 5: Burning bootloader to I/O Board

Fig 6: Done burning bootloaderIn the Arduino IDE, from the *Tools* menu:

- under the *Board* option choose *Arduino UNO*
- under the *Serial Port* option ensure the correct port is selected
- under the *Programmer* option choose *Arduino as ISP*

To burn the Bootloader, choose *Burn Bootloader* from the *Tools* menuYou should see a message *"Burning bootloader to I/O Board (this may take a minute)"* Once the bootloader has been burned, a message of confirming the success gets displayed. "**Congratulations:You're now ready to load sketches onto your Arduino on a breadboard!"**

IV. RESULT

Schematic diagram and interfacing of ARDUINO microcontroller with each module isconsidered**.**

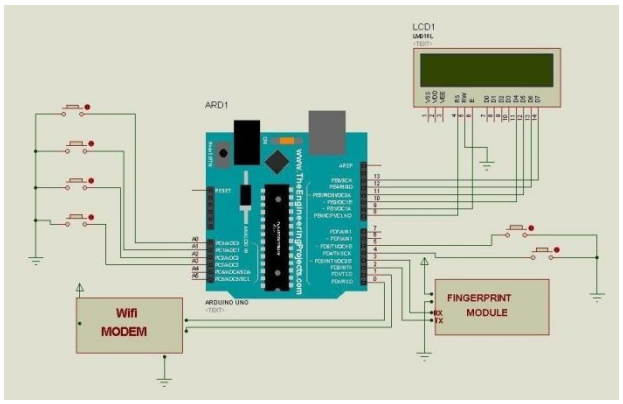

Fig 7: schematic diagram of FINGERPRINT BASED HIGH SECURITY VOTING SYSTEM

The above schematic diagram of **FINGERPRINT BASED HIGH SECURITY VOTING SYSTEM** explains the interfacing section of each component with micro controller.

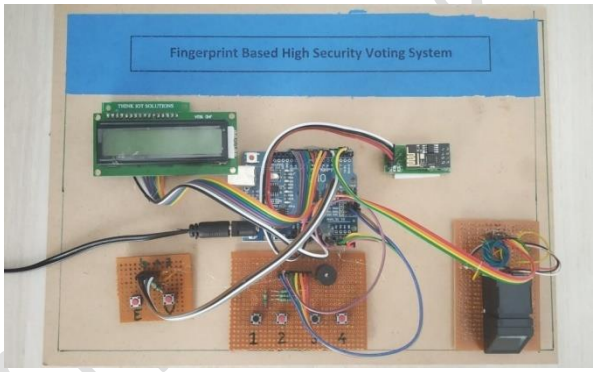

Fig 8 : fingerprint based high security voting system

This project can be used for voting since it over came all the drawbacks so far an ordinary voting machine also provide additional security. Its main advantage is that since finger prints of every person is unique and hence this system completely reduces the chance of invalid votes. This system can be manufactured simply as well as cheap

V. Conclusion

This project can be used for voting since it over came all the drawbacks so far an ordinary votingmachine also provide additional security. Its main advantage is that since finger prints of every person is unique and hence this system completely reduces the chance of invalid votes. This system can be manufactured simply as well as cheap.

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