IoT-MICRO-CONTROLLER BASED SECURED VOTING SYSTEM

(ALSO WITH ADMINISTRATOR AND LEVEL ACCESS)

Introduction

The main aim of this project is to make voting secure using fingerprint verification and to reduce malpractices. The details of the voter along with their fingerprint in stored in database. If the fingerprint matches with the stored fingerprint, the system checks the ID number of the user and if authenticated, it checks if multiple votes have been cast. If the fingerprint matching is not correct "Matching failed" message will be displayed and if ID number is not correct, then "ID does not match" message will be displayed. Fingerprint is used to authenticate the user. There is at least a slight difference between the fingerprints of each person. When a malpractice occurs, "Already voted" message will be displayed.

The system logs the database and the voting process securely into the web server for continuous fair voting process. Also, administrators ID are created to ensure full and total secured management of the voting process with a PIN and admin fingerprint ID.

Key components used & technical specifications

(1) **AS608 optical fingerprint sensor module:** The AS608 optical fingerprint sensor can be used to scan fingerprint and it can send the processed data to a microcontroller via serial communication as well. All registered fingerprints are stored in this module. In this our project, we shall be using this module for all form of fingerprint operations during our voting process which include voters' collection, registration, and authentication.

(2) **SIM800L GSM/GPRS Module:** This is a miniature GSM 2G modem which we can use to accomplish almost anything a normal cell phone can; SMS text messages, Make or receive phone calls, connecting and logging data to internet through GPRS, TCP/IP, and more! In this project, we are using this module to ensure our voting system maintains communication to a web server via a wireless GPRS network to securely upload our data into cloud.

(3) **OV7670 Camera Module:** The OV7670 camera module is a low cost 0.3 mega pixel CMOS color camera module, which is compatible with OV7670 module that can output 640×480 VGA resolution image at 30fps. In this project, we are using this module for a facial capturing process during voter's registration. The face captured shall be stored along with the fingerprint biodata, and an ID number assigned to individual registered voter.

(4) **ATmega2560 chip:** The ATmega2560 is an AVR RISC-based microcontroller that executes very powerful instructions in a single clock cycle. Known for its capabilities in handling more complex projects, the ATmega2560 gives projects plenty of room and opportunities. This allows it to strike a fine balance between power consumption and processing speed. This is the preferred microcontroller to execute our project. It is a powerful chip from the Atmel family of microcontrollers. By executing powerful instructions in a single clock cycle.

(5) **LCD 20 x 4 module:** LCD2004, or 2004 character-type liquid crystal display, is a kind of dot matrix module to show letters, numbers, and characters and so on. It's composed of 5x8 dot matrix positions; each position can display one character. There's a dot pitch between two characters and a space between lines, thus separating characters and lines. The model 2004 means it displays 4 rows of 20 characters. In this project, we are using this LCD as a visual communicator to the administrator, users, and the voters.

(6) **4 x 4 matrix keypad module:** The 4*4 matrix keypad usually is used as input in a project. It has 16 keys in total. In this project, we are using this keypad to give inputs to our voting system. It serves as a channel for Administrative PIN input as well as inputting voter's choice during the voting process.

(7) **Micro-SD card module: With this module, a micro-SD card can be inserted into our voting system to log all biodata and the outcome of our voting process locally.**