

Augment the Safety in the ATM System with Multimodal Biometrics Linked with UIDAI server

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ABSTRACT : *The main aim of this paper is to develop an antitheft system, which is used for ATM machines for enhanced safety measures. In this venture the current security of the ATM (Automated Teller Machine) arrangement has been upgraded by integrating the multimode biometric of the individual into the bank's database which is linked with UIDAI server as to further endorse it. Biometrics-based substantiation offers several benefits over other substantiation procedures. There has been a weighty heave in the use of biometrics for individual substantiation in recent years. Banking services must acquire definite standards to provide a safe and secure environment to the customer. This was accomplished by modelling and edifice an ATM emulator with Microcontroller AT91SAM3X8E on Multimode Biometrics and UID card to enhance the authentication solution system for a specific customer. The outcome is a boosted biometric genuine ATM system that confirms greater safety and increased customer's assurance in the banking services.*

KEYWORDS - Arduino Microcontroller, Fingerprint and Palm print module, UIDAI server, GSM unit

I. INTRODUCTION

Automated Teller Machine (ATM) is provided electronic access to individuals. With the beginning of ATM, banks are able to provide services in any part of the world. ATMs are designed to accomplish the supreme desirable job of banks such as credits, debits, settlements of bills, etc. It accomplishes all these tasks through an access to unique code provided to customers that is personal identification number (PIN), and a plastic card that comprises magnetic chip which hold the customer's information and data provided to the bank. Security is the major concern for banking services nowadays. There are numerous types of threats for the ATM systems few of them are; ATM hacking, Card conning, snooping, etc. To overcome this security threats we proposed the enhance system using multimodal Biometrics &UID card along with GSM unit for verification of individuals. "Biometrics" stands for "life measurement"; term is actually related with the use of sole biological characteristics to identify a specific. The highest bid for biometrics is to provide safety and security to a specific. Though, biometrics documentation has increased its significance in time as workstation craving towards more comfortable and rapid environment of computers for more reliability. A numerous biometric individualities have been developed and are used to substantiate the person's individuality. The inkling is to custom the uniqueness of an individual to ascertain him. By customizing uniqueness we mean the spending the features such as face, iris, fingerprint, digital signature, palm print tongue print etc. In this proposed model we had used a multimodal biometrics comprises palm print and fingerprint technique summed up in one along with the details provided by UIDAI server linked. GSM unit is also used in the proposed model for acknowledgement from the user in case of mismatch identity of the current user and the account holder. The proposed model uses an AT91SAM3X8E microcontroller running at 3.3 volt which matches our need of low price and security enhancing model. This allows linked banks to provide a large number of services with a better secure environment and without any doubt of any security breach.

II. OBJECTIVE

1. To research scope of multimodal biometrics.
2. To develop enhanced and secure ATMs services.
3. To research scope of UIDAI services.
4. To augment the multimodal biometric ATMs security by linking it with UID server.

III. REVIEW OF LITERATURE

Abhijeet S. Kale et al. the principal aim of the described proposal is to improvise the security of ATM system using Aadhaar card and finger print and decreasing the reliability on magnetic card reader [1]. Using ARM 7 microcontroller a model is proposed in the script an additional module for finger print scanner and Aadhaarcad

recognizer, this model is networked by GSM which is linked with security department of bank. This proposed model concludes to solve the security issues up to a level. K.Lavanya et al. aimed for multimodal biometrics for verification token to prevent security breach on ATM users [3]. Initially the verification of an individual is done by PIN and unimodal biometric. But the research suggested the scope of multimodal biometrics and limitations of unimodal over it. A multimodal biometric system sum up the variety of biometric information of individuals to provides a better and efficient way of going. Several existing methods are used for ATM security. Asst. Prof. Sanjay S. Ghodke et al. proposed project uses palm print technique for biometric identification; concluded research on palm print identification had high accuracy and efficiency rate, the used algorithm for palm print recognition speed up the operating process and solving the security issues [4].KandeArchana et al. proposed to enhance the security using multimodal biometrics in ATMs, paper compares the limitations of unimodal biometrics and level of security provided by the multimodal biometrics. By using multimodal biometrics with two tier security the error rates has been reduced. The security level also increased by using multimodal biometrics which avoids the hackers for any breach into the system since the multimodal biometrics provides a better fuzzy logics to the system's security.

IV. WHAT IS BIOMETRIC SUBSTANTIATION?

Every individual holds biological distinctive features. The feature must be one that is general and rarely lost to misfortune or malady for example palm print, finger print, iris, face, DNA, walking style, tongue print etc. This is considered as biological and behavioral features which is unique and can be used as signature to identify the individual amongst all human races [5]. It provides a large number of tokens to authenticate the individuality of specific for better secure and private environment.

V. METHODOLOGY

The proposed model comprises two subparts one is hardware design and other is software design. Hardware design is followed by the desired output of the system accordingly, and software is followed by the platform on which our hardware works firmly. Further details are discussed as follows:

A. Hardware Design

The Microcontroller AT91SAM3X8E is used as the brain of entire system. Furthermore, keyboard, fingerprint scanner, palm print scanner, LCD module are allied with the microcontroller. There are some details of the modules comprises in system:

- Fingerprint module and Palm print module: Fingerprint and palm print are the impression of dermal papillae or friction ridges of human skin. These modules include two parts first a template is created which is the enrolled image of the user stored in the library and second is the matching of the template with the current user [6]. The systems give output of the matching as success or failure accordingly.
- LCD Display unit: For this an LCD display with LED- backlit array is used. It is more cost efficient and having low power consumption as compared to cold cathode fluorescent backlighting LCD display. It is used in many of the reputed mobile companies as the primary product for display. It has a longer life span and more reliability than the conventional LCD display unit [7].
- GSM unit: GSM unit is a speedy and proficient way for the communication, because in this user don't require any special subscription for an SMS. It is highly efficient and integration of GSM unit to RS232 is easy and direct to support all kind of communication requirement like SMS, Voice, Data transferring etc.

The proposed block arrangement for the explained hardware is shown below:

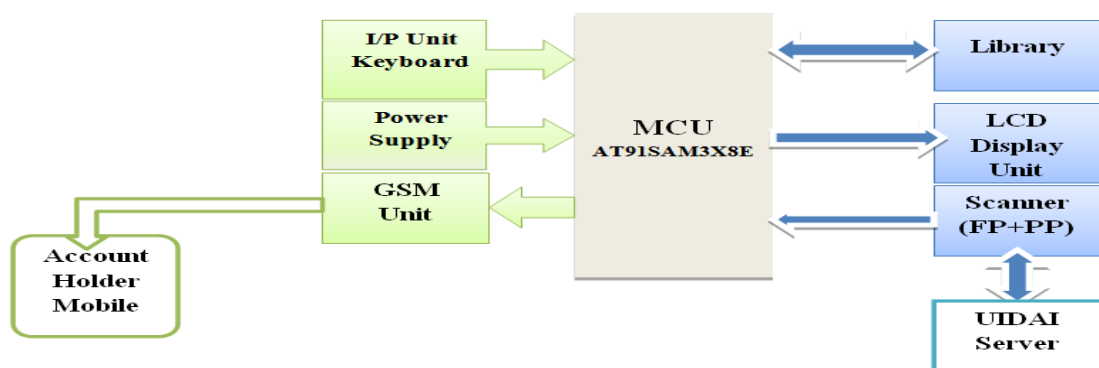


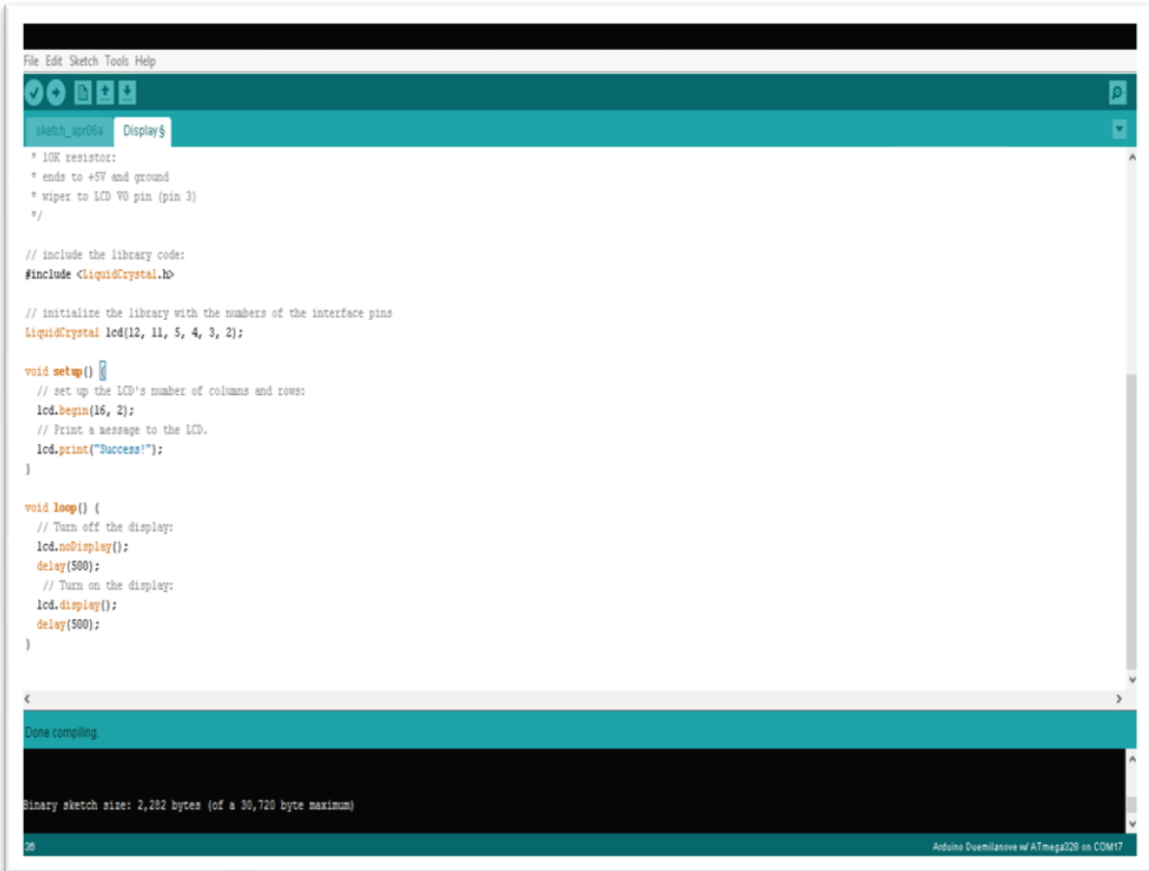
Fig.1 Architecture for hardware of proposed ATM security model

B. Software Design:

The architecture discussed above is programmed in C language with Arduino IDE 1.0.5

Arduino IDE 1.0.5: To communicate with hardware we require Arduino development environment which consist a text editor allowing the user to writes the desired instruction for the assembled hardware, written sketches saved in .pde files [8]. The IDE installs in the default language according to operating system. This IDE streamlines the creating and uploading process to hardware. Procedure to communicate with hardware unit as:

1. Sketching: In this we write the instructions for the desired outcomes accordingly, this we have done with C language the sketch is always written in C language.
2. Verifying: The written sketch is compiled by this process in the menu list there is a verification tab present by selecting that we have done the compilation of the instructions.
3. Uploading: After getting the successful compilation we uploaded the instructions to the hardware by selecting the board and the uploading port in tools option and compiled data is uploaded by selecting the tab in the main screen.



```
File Edit Sketch Tools Help
sketch_ap06a Display$
* 10K resistor:
* ends to +5V and ground
* wiper to LCD V0 pin (pin 3)
*/
// include the library code:
#include <LiquidCrystal.h>
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  // Print a message to the LCD.
  lcd.print("Success!");
}
void loop() {
  // Turn off the display:
  lcd.noDisplay();
  delay(500);
  // Turn on the display:
  lcd.display();
  delay(500);
}
Done compiling.
Binary sketch size: 2,282 bytes (of a 30,720 byte maximum)
Arduino Duemilanove w/ ATmega228 on COM17
```

Fig.2. Compiled program for LCD display

VI. CONCLUSION

We have been able to develop a multimodal biometrics and UID card mechanism to enhance the security measures in the ATM services given by the banks. The model of the developed hardware has been found encouraging on the basis of its sensitivity and to identify the UID card holder and current user for the ATM system. This system when completely accepted throughout the globe will reduce the possibility of fraud to a minimum level. The assembled biometric traits and UID card will produce better security aspects and will increase the customer confidence in the use of services provided by the bank.

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