AN EMBEDDED REAL-TIME FACE AND FINGER VEIN RECOGNITION SYSTEM FOR ATM SECURITY

M.Dhivyasree[1], G. Prangothi[2]
[1]*M.E.(Embedded system technologies), PG Scholar, The kavery engineering college*
[2]*Assistant Professor, Department of Electrical and Electronics Engineering, The kavery engineering college*

***Abstract*— In this project, we propose a real-time embedded face and finger-vein recognition system for authentication on ATM devices. The system is implemented on an embedded platform and equipped with a novel face hardware modules: image acquisition and finger-vein recognition algorithm. The proposed system consists of three module, embedded main board, and human machine communication module. In this concept at first the RF get received and then in matlab face and finger vein image is given and it gets compared with the database image if it get authorized transaction page will be opened or else it get unauthorized and sms will be generated to crime branch and the owner.Private information is traditionally provided by using passwords or Personal Identification Numbers (PINs), which are easy to implement but is vulnerable to the risk of exposure and being forgotten. Biometrics, which uses human physiological or behavioral features for personal identification, has attracted more and more attention and is becoming one of the most popular and promising alternatives to the traditional password or PIN based authentication techniques. The face and finger-vein is a promising biometric pattern for personal identification in terms of its security and convenience. The vein is hidden inside the body and is mostly invisible to human eyes, so it is difficult to forge or steal. The non-invasive and contactless capture of finger-veins ensures both convenience and hygiene for the user, and is thus more acceptable. The finger-vein pattern can only be taken from a live body.**

***Index Terms*- Matlab, real time embedded,**

I. INTRODUCTION

A Real-time embedded face and finger-vein recognition system for authentication on ATM devices. An embedded system has specific requirements and performs pre-defined tasks unlike a general purpose personal computer. An embedded system is a combination of computer hardware and software and perhaps additional mechanical or other parts, designed to perform a dedicated function.

The system is implemented on a DSP platform and equipped with a novel face and finger-vein recognition algorithm. The experimental results demonstrate that the proposed face and finger-vein recognition system is qualified for authentication on devices. Private information is traditionally provided by using passwords or Personal Identification Numbers (PINs), which are easy to implement but is vulnerable to the risk of exposure and being forgotten. Biometrics, which uses human physiological or behavioral features for personal identification, has attracted more and more attention and is becoming one of the most popular and promising alternatives to the traditional password or PIN based authentication techniques.

A facialrecognitionsystem isa computerapplication fo r identifying or verifying a person from a digital image or a video frame from a video source. One of the ways to do this is by comparing selected facial features from the image and a facial database.

The non-invasive and contactless capture of finger-veins ensures both convenience and hygiene for the user, and is thus more acceptable. The face and finger-vein pattern can only be taken from a live body. The proposed system consists of three hardware modules: image acquisition module, embedded main board, and human machine communication module.

The image acquisition module is used to collect finger-vein images. The Embedded main board

including the Microcontroller chip, memory and communication port is used to execute the finger-vein recognition algorithm and communicate with the peripheral device. The human machine communication module (LED or keyboard) is used to display recognition results and receive inputs from users.

II.EXISTING SYSTEM

Private information is traditionally provided by using passwords or Personal Identification Numbers (PINs), which are easy to implement but is vulnerable to the risk of exposure and being forgotten. Biometrics, which uses human physiological or behavioral features for personal identification, has attracted more and more attention and is becoming one of the most popular and promising alternatives to the traditional password or PIN based authentication techniques.

There is a long list of available biometric patterns, and many such systems have been developed and implemented, including those for the face, iris, fingerprint, palmprint, hand shape, voice, signature, and gait. Notwithstanding this great and increasing variety of biometrics patterns, no biometric has yet been developed that is perfectly reliable or secure.

III.BLOCK DIAGRAM:

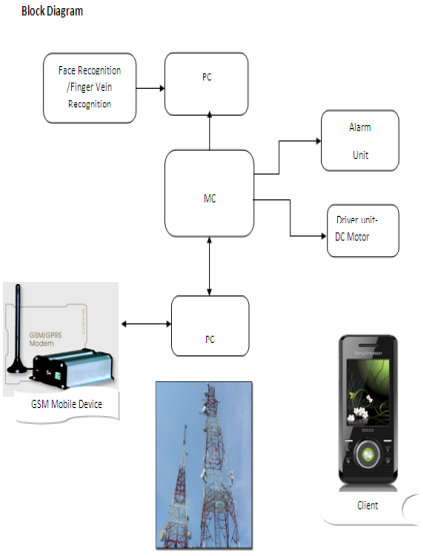


FIG.1 Block diagram of real time face and finger

It consists of PC memory unit it stores the different driver image.FDS (finger detection subsystem) is used to detect the finger vein compare it with the predefined image. If the image doesn't match then the information is send to the owner through SMS. Owner can trace the location through GPS. This system owner can identify the theft image as well as the location of the particular thing. GPS is very helpful in tracing the devices and it sends the exact location of the theft items. Also the system which uses the finger vein as recognizing agent that seems helpful to the owner so that no other access the card. The Embedded main board including the Microcontroller chip, memory (flash), and communication port is used to execute the finger-vein recognition algorithm and communicate with the peripheraldevice.Somefacialrecognition algorithms id entify facial features by extracting landmarks, or features, from an image of the subject's face. For example, an algorithm may analyze the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw. Emerging trend uses the visual details of the skin, as captured in standard digital or scanned images. Other biometrics like fingerprints, iris scans, and speech recognition cannot perform this kind of mass identification.

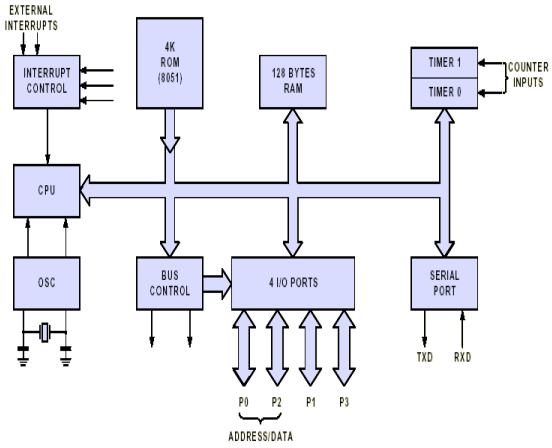


Fig.2.Block Diagram of 8051 core

IV.SOFTWARE TOOLS

1. KEIL C
2. MATLAB

V. HARDWARE TOOLS

a) GSM MODEM:

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz.

b) THE GSM NETWORK

The GSM specifications define the functions and interface requirements in detail but do not address the hardware. The reason for this is to limit the designers as little as possible but still to make it possible for the operators to buy equipment from different suppliers. The GSM network is divided into three major systems: the switching system (SS), the base station system (BSS), and the operation and support system (OSS). The basic GSM network elements are shown in below figure.3

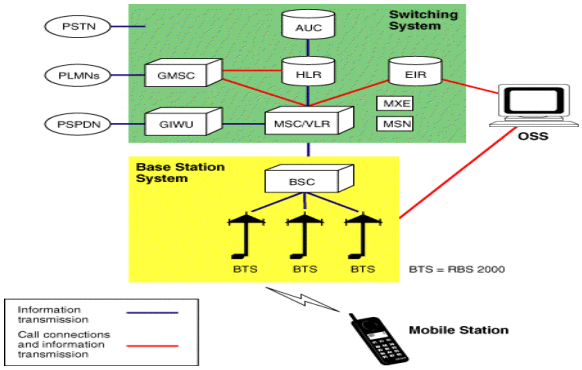


Fig.3 The basic GSM network elements

These extended AT commands are defined in the GSM standards. With the extended AT commands, you can do things like Reading, writing and deleting SMS messages, Sending SMS messages, Monitoring the signal strength, Monitoring the charging status and charge level of the battery, Reading, writing and searching phone book entries. The number of SMS messages that can be processed by a GSM modem per minute is very low -- only about six to ten SMS messages per minute.

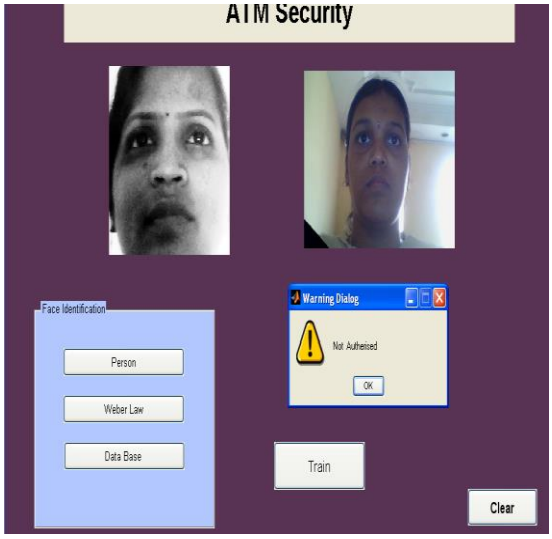
Fig.4 The Application of GSM Modem

VI. FACTS AND APPLICATIONS OF GSM/GPRS MODEM

using AT command interface. An antenna and a The GSM/GPRS Modem comes with a serial interface through which the modem can be controlled power adapter are provided. The basic segregation of working of the modem is as under

- Voice calls
- SMS
- GSM Data calls
- GPRS

VII. OUTPUT MODEL



VIII. CONCLUSION

The present study proposed an end-to-end face and finger-vein recognition system based on the blanket dimension and lacunarity implemented on a DSP platform. The images from in the dataset were

taken over long time interval (i.e., from summer to winter) by a prototype device we built. Thus we propose the existing system as finger vein detection which helps in pre defined task of identification and recognization of the person and authenticating the personal identification and convey to the owner if the authenticating information is wrong. The alert messages have been send to the mobile phones when the un identificated authentication is passed in the system. This is the main concept of the proposal which have been enhanced form the existing system which makes alone the recogiznation. Thus the proposed system is able to identify the unauthorized logins.

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