

# Real Time Embedded System for ATM Authentication using Wireless Module

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**Abstract:** In this project, a real time finger vein system for a security in ATM machine is proposed. In ATM user or bank sector, there is no enough security for users, so provide more security to user finger vein method is used. The finger-vein is a biometric authentication for personal identification in terms of its own security. Everyone has unique finger vein, and it cannot be stolen by anyone because finger vein is inside the body it varies for everyone. Initially, the finger of the users is stored in the database. User finger vein is compared with a database; if it matches the database allow the user to the further process. And generate the OTP password for mobile devices. If it does not match with the database, it display not authentication person and alert by using buzzers.

**Keywords:** ATM machine, finger vein, OTP password.

## I.INTRODUCTION

The theft occurs in the ATM or other bank sector can be protected by means of authentication. The various techniques such as one time password, fingerprint, mobile phone intimation's used for providing authentication in the entire system. But, it cannot be sufficient to secure the system, so we move on to biometric authentication i.e. finger vein. A unique characteristic of a human being is used to automatically identify an individual or verify an identity. The finger vein of the each user can collect and maintain database for entire the user. This is because other than an authorised user can't be used. The user finger vein is first verified by comparing the input finger vein with finger vein in the database, if it matches it allow the user to proceed otherwise it get comes out.

In finger vein method for segmentation using repeated line tracking and automatic triumph generation. In repeated line tracking it focus only direction, when a low quality image is segmented, the image should not be clear [1]. In existing method, fingerprint method is used it is not more security. Additionally, for ATM centres they also provide automatic temperature control technique for detecting the fire, if the fire will happen in the centres it automatically ON the sprinkles. Using Tilt sensor and DC motor the shutter will automatically ON [2]. In this fingerprint is used, it is not secured,

the fingerprint is stolen easily [3]. ARM CORTEX-M3 is used for fingerprint recognition it has two modes. One is administration mode and it is used to register the new user and gives the mode of authorization and second is user mode for the users [4]. ARM9 processor is used to detect the finger print and it is advanced, and it used lockers, bank locker, ATM centres. It consumes low power [5]. AT89C51 is used to detect the finer vein and its lowest when compared to arm and the memory is very less. It takes only 0.5 seconds to recognise the input [6]. From this paper finer vein is identified for even identical twins, both false acceptance ratio (FAR) and false rejection ratios (FRR) are calculated [7].

In ATM centres, there is no security for users and the user has faced so many problems. To avoid these problems, use finger vein module. A system for identification using a person's unique vein pattern. Vein as a biometric tool that transfer the deoxygenated blood to all parts of the body. Finger vein is exclusive in the body and it is not pinched by anyone. Because everyone has unique finer vein, an attacker may misuse the finer vein, it will alert by buzzer using voice chip. First, the finger vein is stored in a database and then the user may use the ATM centre, the finger vein is compared with database finger vein image. If the image matches it goes for further process and results as authorized one. Then the money transaction takes place. Using this method it will avoid the theft and the user has full security to use the ATM centres.

### A.IMAGE ACQUISITION

In image acquisition the finger vein is taken as an input. But the input image consist of blur and noise, so image clarity can be improved by removing the blur and noise through pre-processing technique.

### B.PRE-PROCESSING

Pre-processing is an improved the image data that suppress unwanted distortions or enhanced some image features important for further processing. The pre-processing method consists of image enhancement, image segmentation and feature extraction.

### C.IMAGE ENHANCEMENT

Image Enhancement involves the adjustment of digital data for improving the image qualities with the aid of computers. The processing helps in enhancing the clarity, sharpness and details towards extracting information and further analysis. Enhancement distorts the digital value; therefore enhancement is doesn't initiate until the restoration process are completed.

Image Enhancement alters the visual impact that the image has on the interpreter in a fashion that improves the information content

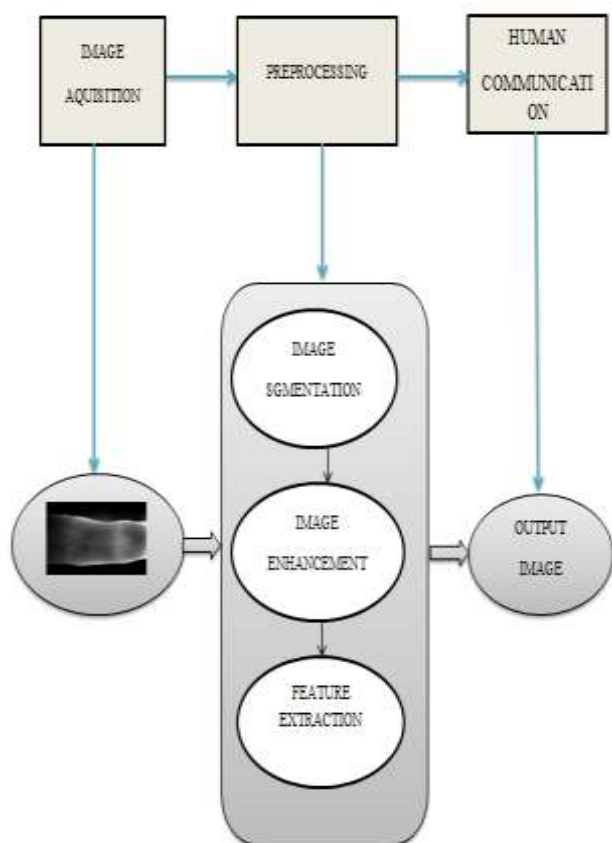
1. Contrast enhancement
2. Intensity, hue, and saturation transformation
3. Density slicing
4. Edge enhancement
5. Making digital varieties
6. Producing synthetic CD images
- 7.

**D. IMAGE SEGMENTATION**

Image segmentation is the division of an image into sub images or categories, which correspond to different objects or parts of objects. Every pixel in an image is due to one of a number of these images.

Segmentation contains:

- Pixels in the same category have similar grey scale of multivariate values and form a connected region,
- Neighbouring pixels which are in different categories have different values.



**Fig.1 Block Diagram**

**E. FEATURE EXTRACTION**

In feature extraction the required information can be extracted from the processed image for their requirement in the application.

**F. HUMAN COMMUNICATION MODULE**

The extracted image has been taken from the human communication module.

**II RESULT**

MATLAB platform is used to simulate the finger vein module and the result is compared with database image, if it matches the person is authorized person and if it does not match the person is unauthorized.

**A. Image:**

The authorized person finger vein is stored in database. In user image is consider as person who wants to take the money in the ATM centre. If the two images matches next process will obtained. Otherwise it results as unauthorized person.

**B. Haar Transform:**

The main purpose of using Haar transform is to perform the transform and its inverse operation simultaneously in the system.

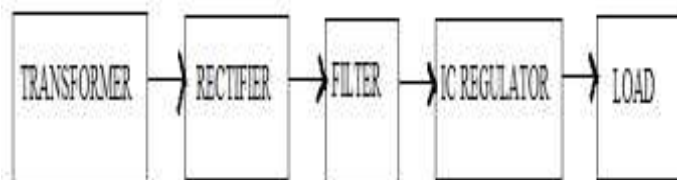
**C. Segmentation**

Segmentation is used to divide the image into sub image from this the desired image can be obtained.

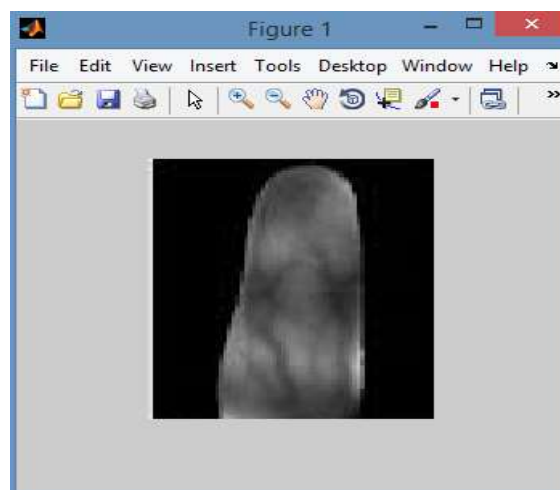
**III HARDWARE REQUIREMENTS**

**A. BLOCK DIAGRAM**

The ac Voltage, typically 220V RMS, is connected to a transformer, which steps that ac voltage down to the level of 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.



**IV EXPERIMENTAL RESULT**



**Fig.1 DATABASE IMAGE**

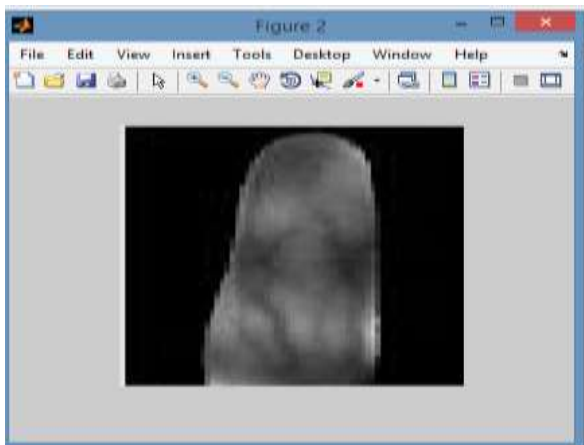


Fig.2 INPUT IMAGE

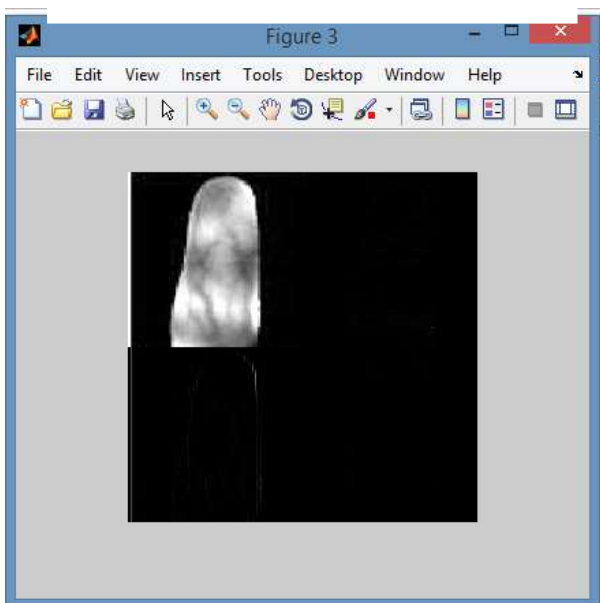


Fig: 3 SEGMENTATION PROCESS

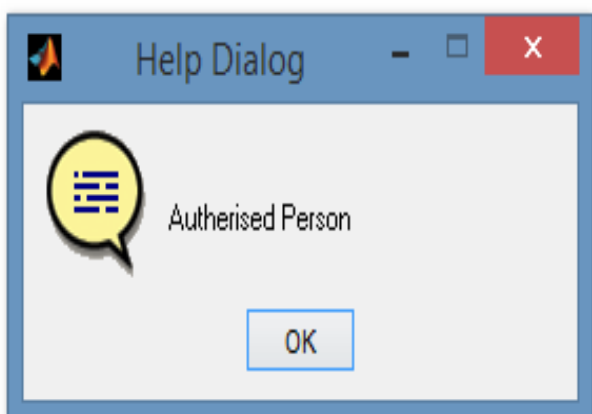


Fig.4 AUTHENDICATION PROCESS

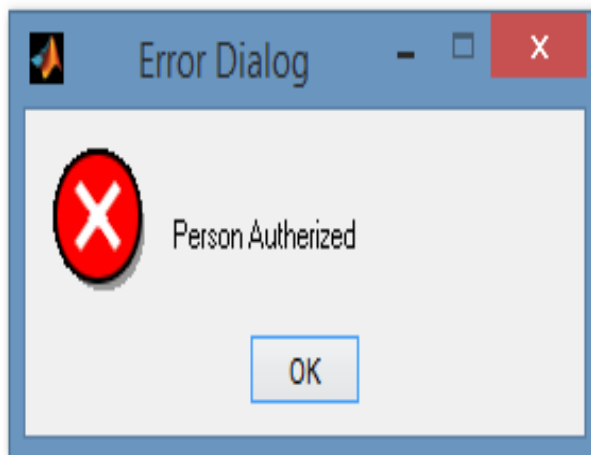


Fig.5 TRANSACTION ALLOW

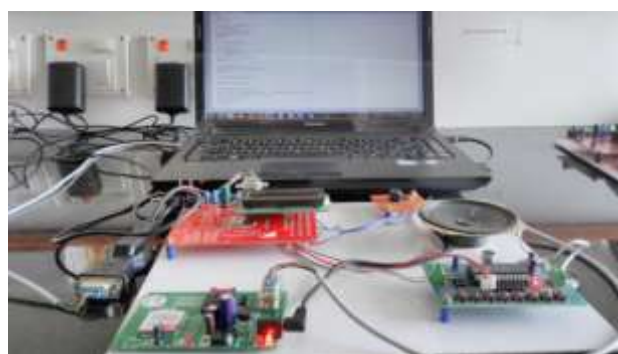


FIG .6 HARDWARE IMPLEMENTATION OF PROPOSED SYSTEM

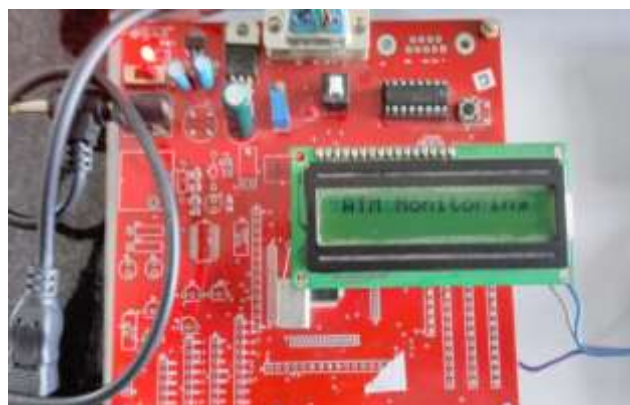


Fig.7 ATM MONITORING



**Fig 8 AUTHORIZED PERSON**

**Fig 9 UNAUTHORIZED PERSON**



## V. CONCLUSION

The drawback of the existing system is overcome by using finger vein based user identification system. This paper provides excellent immunity against unreliable practices and it also very favourable to the users. The results the high performance for high accuracy and despise for wrong matches. The proposed system will efficiently in MATLAB software. The proposed system can be effectively used for authentication in banking, consumer electronics, and airport, space and defence applications.

## FUTURE SCOPE

This project is implemented in hardware using LPC2148 and also gives information to mobile phones using GSM.

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