

Biometrics Based Security System For Bank Lockers With OTP Support

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Abstract-

Now-a-days biometrics are emphasize by security systems mainly because of two purposes i.e. identification and verification of users. Sometimes there is a need where only officials are allowed and in such circumstances proper identification of person is essential to avoid unauthorized entry in authorized area like bank locker, R&D labs, automated border crossings etc. If these identification processes are performed manually by security guards then identification of each person will be difficult. To avoid these time consuming and error proven processes we have proposed biometrics based security system for bank lockers based on iris recognition and detection, fingerprint recognition and detection and one time password (OTP) to recognize the person. This biometrics system thus uses two distinct characteristics of human i.e. the iris and the fingerprint. This system will give information of person who is recognized by the system and can access control of person in prohibited areas.

Index Terms–Recognition and detection of iris, fingerprint and OTP support.

I. INTRODUCTION

The main objective of the project is to develop a system with high level of security for prohibited areas using iris recognition and detection, fingerprint recognition and detection and one time password (OTP) to display recognized person information and to access control of the person. If these identification processes are performed manually by security guards then identification of each person will be difficult. Also these are time consuming and error proven processes.

Use of biometrics is increasing because these qualities are difficult to reduplicate. Fingerprint

is most common biometric characteristic because of its various advantages. Other biometrics that are used for identification includes signatures, hand geometry, retinas, patterns of palm veins, facial characteristics and vocal qualities.

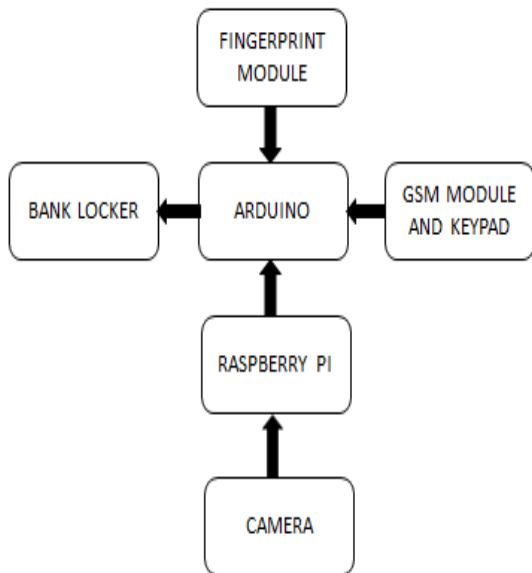
One of the main advantages of iris recognition is its stability. As compared to other image processing system iris recognition method gives better performance. Iris recognition system can be used to identify individuals or to prevent unauthorized access.

One of the most important biometric technologies is fingerprint (FPs). Fingerprint is the pattern of ridges and valleys on fingertip, which is also known as furrows. For any fingerprint, ridge characteristics and their relationship are unique. Two application areas in this field are fingerprint identification and FPV i.e. fingerprint verification.

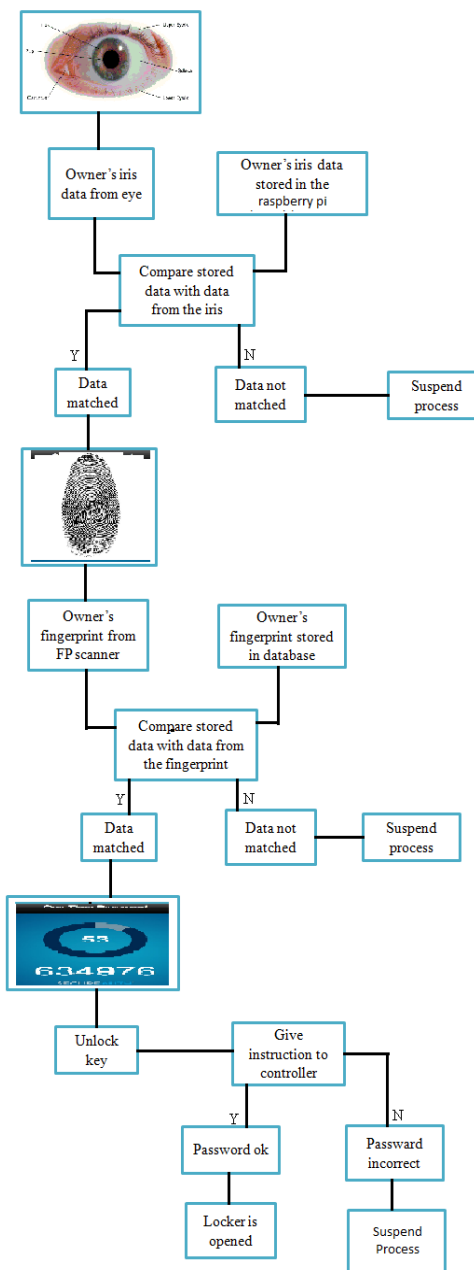
One time password (OTP) support was proposed to increase security level in common types of security. The OTP is generated by a token which is possessed by the user and it is input to authentication system. The generated OTP is compared with entered OTP. If input OTP matches with generated OTP it indicates that user is authenticate and can access the system.

II. USED APPROACH:

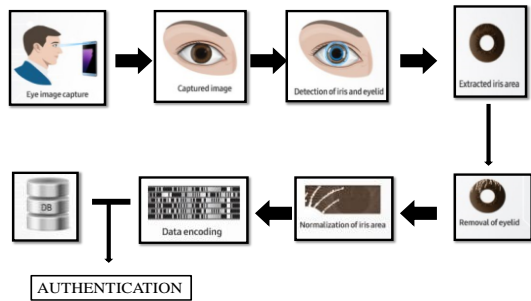
A. Block diagram



B. Methodology



C. Iris Recognition And Detection:



Iris based security system works in two major steps i.e. iris recognition system to identify the person and iris recognition system integrated with microcontroller and LCD. Iris recognition system is a five step process that are iris segmentation, iris normalization, feature encoding, template matching and accept/reject decision.

Iris segmentation deals with segmenting the iris part from an eye image. Captured eye image is an input for this stage.

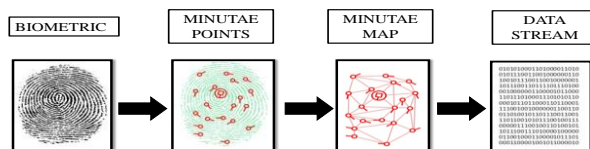
In iris normalization process segmented iris image is remapped in fixed rectangular image.

In feature encoding a template representing iris pattern information is created.

Later, goal of template matching step is to evaluate the similarity of two iris representations.

If templates are matched, the human identification is accepted else rejected.

D. Fingerprint Recognition And Detection



Three types of fingerprint patterns are arches, loops and whorls.

- Arches: The pattern whose ridges route from one side to the other side lacking any type of location called as arches. Four types of arches are radial arches, tented arches, plain arches and ulnar arches.
- Loops: The pattern, whose ridges moves inwards and return in line to the origin is known as loops. Four types of loops are plain loop, lateral pocket loop, twinned loop and central pocket loop.
- Whorls: The pattern whose ridge makes a circular formation around a central point is called as whorls. Four groups of whorl patterns are plain whorls, central pocket loop whorls, accidental whorls and double pocket loop whorls.

Methods used for fingerprint security are:

Minutiae based approach

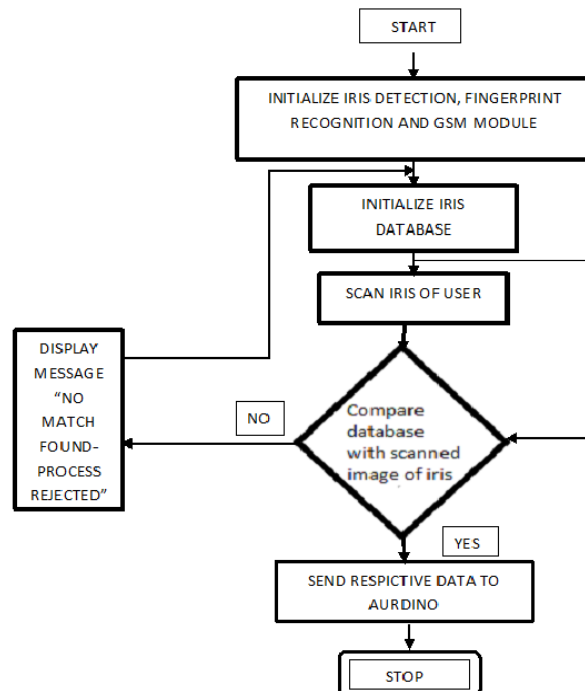
- This includes four stages and is defined as:
- Minutiae extraction
- Orientation field assessment
- Ridge extraction
- Post processing

E. One Time Password (OTP)

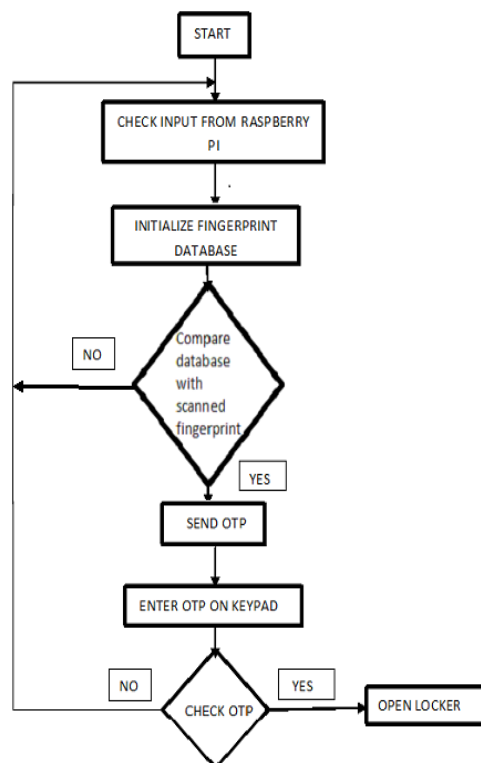
OTP is password authentication scheme in which a new password is generated for each authentication session. Properties of one time passwords ensure the resistance towards various common attacks and the uniqueness of human perception makes it usable. Algorithms of OTP generation uses pseudo-randomness or true-randomness. This is necessary because future OTP's can be easily predicted by observing previous ones.

III. FLOWCHART:

A. Flowchart of raspberry pi:



Flowchart of arduino:



IV. ADVANTAGES:

- Iris and fingerprint both are the unique characteristics of human being.

- Provides accurate identification.
- Versatile and Scalable.
- Easy and safe for use.
- Time saving and convenient.
- User friendly system.
- Use of fingerprint to avoid any fooling involved.

v. APPLICATIONS:

- Bank lockers security.
- Border crossing control
- Criminal identification
- Military base station security.
- Security systems in R&D labs.
- ATM
- Aviation security

VI. CONCLUSION:

This project should be able to implement biometrics based security system. The main aim of the project is to secure bank lockers. It can also be used for R&D labs and military base stations. As the process go, camera first scans the iris of the user and if it matches with his saved database it further scans the fingerprint, verifies it and send OTP after which the user can open his locker. If the match is not found at any stage in the process, it gets suspended.

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