Smart Attendance System using Raspberry Pi

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Abstract:- Now days, Biometric attendance system is used in many applications. This entire work is done on the Linux based embedded computer called raspberry pi, in which database creation, fingerprint recognition and python programming is totally done on raspberry Pi. This paper discusses on the standardized authentication model which is capable of fetching and matching the fingerprint from database.

Keywords:- Fingerprint Authentication, Python, Raspberry Pi.

I. INTRODUCTION

The human body has a unique feature. This feature has led to the field of biometrics. Its use is secure in a variety of fields with embedded controllers and computers. It is now used in places such as airports, hospitals, schools, colleges, corporate offices etc.

The biometric system includes finger verification, facial recognition, palm appearance etc. All of these strategies work for a different level of performance.

It is a very old method and yet it is used simply because of its accuracy and simplicity. Everyone is born with a unique pattern on the fingers and DNA and this feature is used to identify two different people.

II. RELATED WORKS

2.1. DEVICE SUPPORT

I knew the essential features of every fingerprint scanner and checked the compatibility of the entire device. R305 is finally being finalized for use.

2.2 LITERATURE SURVEY

In this way the designer is an engineer who focuses on the Integrated Fingerprint Identification Service which is a very popular of the popular police agencies. Their finger-drawn pattern is characterized by a group of ridgelines that always flow uniformly, but run and cut at other points. the personality of the fingerprints is set by the characteristics of the indigenous spine and their relationships. Many automation systems of the local fingerprint comparison unit are supported by trivia similarity Nowadays, fingerprint recognition is one of the most advanced biometric technology supported by fingerprint imaging. in this way they raise the level of fingerprints. In the case of fingerprint recognition, an important step affecting the accuracy of the system is the same between the model and the fingerprint queries. This method supports individual personality and separates biometric tool separation to transfer information obtained in this way they mistreat fingerprint and the same algorithmic rule and that they store information to show who is approaching access using a web page created within the native server.

III. SYSTEM OUTLINE

3.1. HARDWARE ARCHITECTURE
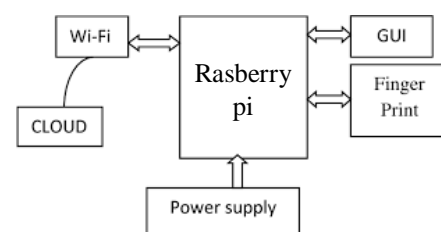
**Fig 1: Proposed System Block Diagram**

This proposed system consists of raspberry pi and fingerprint module.

3.1.1 Raspberry Pi

This hardware can be a portable device that will be touched or held, a type of disk or portable disk. code is often thought of as a program or group of programs that dictate what a pc should try and what to do and how to try to do it. Below is a picture of the Raspberry Pi that describes the many components that make up the hardware.

3.1.2 FINGERPRINT READER

The R305 module supports both windows and the Linux-based system. Scanning the fingers properly when the user places a finger on it.
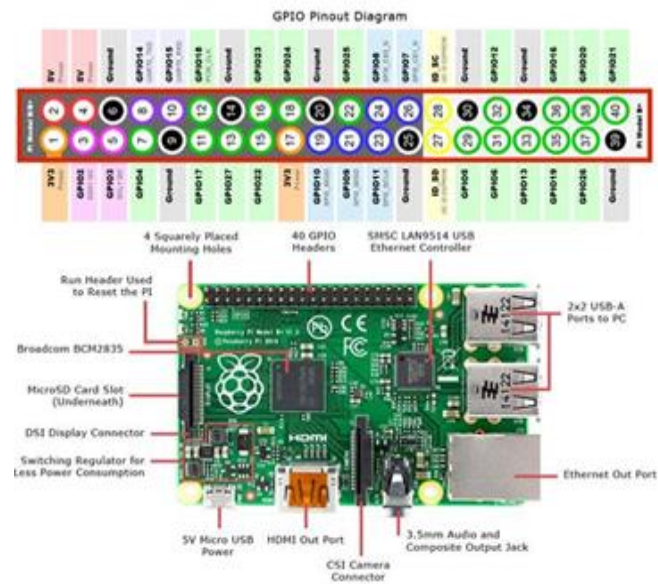
It offers a high-quality and reliable fingerprint template and a gingerbread computer.

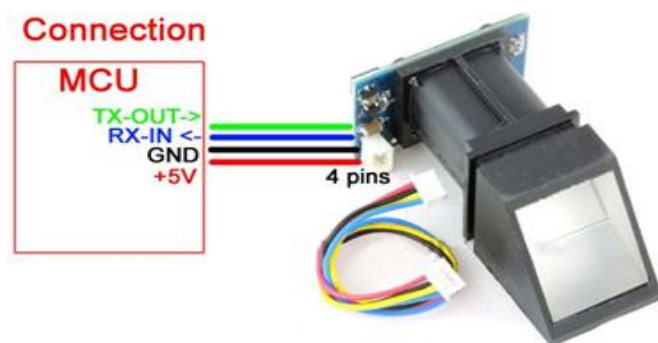The device can automatically control encryption, and data transfer through the USB interface.

Fig 3: Finger print module

This module is found to be very reliable in all intelligent OS, even its easy to interact with raspberry pi.The R305 Module Associate degreed digital Persona Fingerprint Recognition Engine has unparalleled ability to verify even the most sensitive fingerprints accurately.

3.1.3 GUI (Graphical User Interface)

It is an interaction that allows the user to interact with the device. Visual cues such as duplicate typing, replacing the

text-based user interface, typed command labels or text roaming.

3.1.4 POWER SUPPLY

Model uses 5 volt power supply and has a ability to drive 2.5 amperes of current.

3.2 SOFTWARE ARCHITECTURE

In this project the softwares used are like MySQL, opencv (python script). The procedures for setting up, saving and retrieving fingerprint processes are described in future chapters.

3.2.1 SOFTWARE- ALGORITHM

The software algorithm of authentication system is described here,

i. Process Starts
ii. Select the option to enrol new fingerprint or delete previous ones.
iii. If nothing is selected it scans for the wifi network and joins if new known network.
iv. If none of the known network are present than it displays all the available network.
v. Any of the new network can be selected and joined by entering the password.
vi. Once the connection is established it starts scanning for the fingerprints.
vii. When a teacher scans his/her fingerprint it asks for the class and lecture for which attendance is being taken.
viii. Now the students can scan their fingerprints.
ix. Whenever it recognises any student it send their fingerprint ID to the server through packet data transmission.
x. When a server receives the data from the system it updates the attendance of the student.
xi. When the attendance of all the students is taken, any student can check his/her attendance on the android application.

3.3 IMPLEMENTATION PROCEDURE

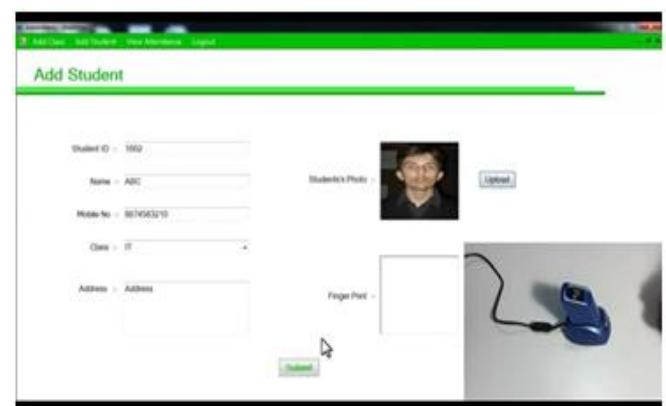### 3.3.1 FPRINT DEMO: GRAPHICAL

DEMONSTRATION APPLICATION

Fig 4: Capturing of fingerprint template

This edited program is forced into a UNIX-based application based on the GUI application, the printer model and the fingerprint model, with the intention of violating this to demonstrate the functionality of the fingerprint device next to the raspberry pi installed inside. fprint demo provides Associate link for fingerprinting and deleting fingerprint registration information with the help of fprint GUI, degree degree interface to ensure selected finger joints

3.3.2 CONVERTING THE TEMPLATE IN TO BINARAIZED TEMPLATE

This graphical user interface is capable of changing the fingerprint guide in to binary guide. The imaging performance of this device is superb. The came pictures square measure giant and realize an oversized variety of trivialities, resulting in appropriately distinct scores for matching/non-matching fingers. Fig four shows a picture came by this driver and its binarized type with trivialities planned with the assistance of raspberry pi embedded laptop.

Fig 5: Normal and binarized template

IV. EXPREIMENTAL RESULTS

After removing the fingerprint interface for fingerprint display, Afterwards the comparison is extracted with the help of an open cv program tool with python text and generating transit file details to transfer to the cloud.

The below figure shows the image of mismatched fingers, which is identified by the python script which uses the special image processing algorithm called FLANN_INDEX_KDTREE with cv2.FlannBasedMatcher Fig 6 given below shows mismatched fingerprints of different persons the python program is running as the background process.
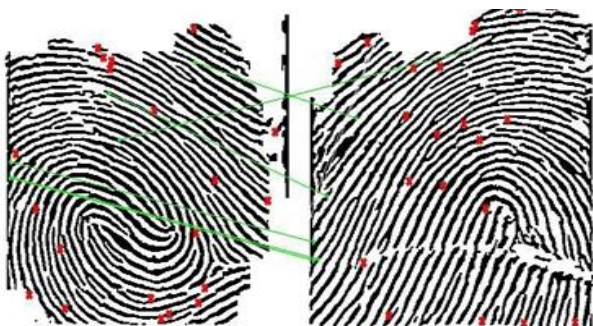

Fig 6: mismatched finger ridges in template

Thus the above figure shows the mismatched characteristics of two different fingers, while comparing the same fingers I got the matching points almost every where in finger templates.

V. CONCLUSIONS AND FUTURE WORK

Recognition of fingerprints is one of the hallmarks of Biometric style and technology. Nowadays, it is used in many real-time applications. However, recognizing fingerprints in the UNIX operating system is primarily based on detecting python mischief done entirely in raspberry pi This paper discusses the standard fingerprint model used to compile the fingerprint guide guide. with this model, if the pre-processing step, note the changes between the templates, control the parameters and combine fingerprints. Thereafter the employment of matching fingerprints on fingerprints within the information to determine the suitability of this model. Embedded computers (still in pi piano) ar remains a daunting task. all of this work is completed in the UNIX operating system primarily based on an embedded laptop called raspberry pi, where data building and management, fingerprint access, authentication and targeting must be done to increase system accuracy and improve real-time high-resolution cloud abuse application development. created done. In the future this one device can be enforced, and used by several educators.

VI. ANDROID

Android can be portable software developed by Google, supports the Linux kernel and is designed for bit screen mobile devices such as smart phones and tablets. The request was made to check the code to go to the organization's usage code.

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