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IoT Based School Monitoring System

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Abstract:
There are many ways in which government has been striving to provide the necessities for the poor children in the government schools. But somehow the resources are being looted more and more showing the fake attendance of the students. The scheme of mid day meals is being misused by showing the false count of the students attending the school and some students are totally being absent for the whole academic year. As these problems result in improper utilization and scarcity of funds, the solution to this problem is to bring each and every fault to the notice of the authorities by updating the day to day status of the government schools with the help of a bio metric aided system which helps in the continuous check of the students in that particular school using Internet of Things. Internet of things (IoT) is the inter-networking of physical devices, vehicles buildings embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. This consists of a bio metric module which recognizes the fingerprint of the registered student in the particular school. Camera is for continuous monitoring of the class.

Keywords: Internet of things (IoT), bio metric aided system, bio metric module, network connectivity, fingerprint, Camera

I. INTRODUCTION

School monitoring using Internet of Things is a system which assists the school managements in daily administration, reporting and following up tasks. Although every school in the country has a daily attendance record, it is not being updated accurately and the funds released by the government are being misused as a result of the improper record of the students count every day. The Internet of things (IoT) is the inter-networking of physical devices, vehicles buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, it encompasses technologies such as smart schools.

II. PROPOSED SYSTEM

The working of the proposed system can be understood from the block diagram shown in figure1.This consists of a bio metric module which identifies the fingerprint of the registered student in the particular school and captures in such a way that only the required portion of the finger is recognized, removing the noise. It undergoes 1:1 and 1:n comparison during the access time which helps in the identification of the particular user and the captured data will be readily shown in the android application. The data 11 stored in pi can be accessed and can be retrieved through cloud whenever we require it. The information about each and every captured finger print is stored in raspberry pi. Each finger print occupies a space of 500 KB. Camera is for continuous monitoring of the class. In case of any sudden inspection from higher authorities, the

camera is used. The data obtained will be stored in the cloud and it may also be used for re-checking through the android application designed.
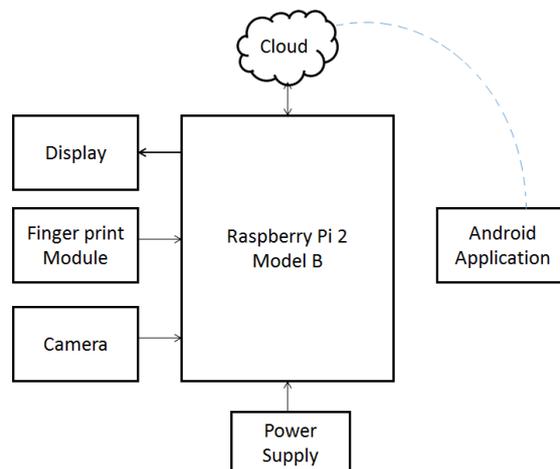

Figure 1

III. HARDWARE REQUREMENTS

RASPBERRY PI
The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated, selling outside of its target market for uses such as robotics. Peripherals (including keyboards, mouse) are not included with the Raspberry Pi. Some accessories however have been included in several official and unofficial bundles.

FINGERPRINT SCANNER
Fingerprints' offers a complete range of technology for working with fingerprint biometrics that can be used

separately or in combination, including sensors, biometric processors, and modules. The competitive advantages offered by Fingerprints' technology include unique image quality, extreme robustness, low power consumption, and complete biometric systems.

WEB CAMERA

Webcams are video capturing devices connected to computers or computer networks, often using USB or, if they connect to networks, Ethernet or Wi-Fi. They are well-known for low manufacturing costs and flexible applications. Webcams typically include a lens, an image sensor, and some support electronics. Various lenses are available, the most common being a plastic lens that can be screwed in and out to set the camera's focus. Fixed focus lenses, which have no provision for adjustment, are also available.

IV. RESULTS

To the Raspberry Pi2 model B module as shown Figure-2, consists of four ports to which a keyboard and a mouse is connected. A Web camera is connected to the third USB port. A LAN cable is given to the Ethernet port. Fingerprint module is connected to the GPIO pins 4, 6, 8, 10. The HDMI cable is connected to the display of the PC and the power supply is taken through the CPU.
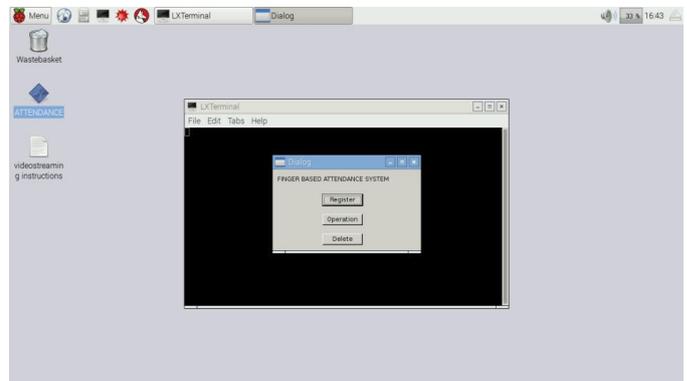

Figure 2

ACCESSING OF FINGERPRINTS

The red light on the Biometric module indicates that it is ready to take the fingerprint shown in Figure-3. A finger is placed on the Biometric module to access the fingerprint

Figure.3

After the fingerprint is taken three options Register, Operation, Delete will be displayed in the Attendance.exe file shown in Figure-4

Figure.4

V. CONCLUSION

The proposed IoT Based School Monitoring System enhances and supports monitoring and control of schools from any authorized location. So, it aids the higher officials of educational institutions. In this, a fingerprint-based attendance management system is presented. The developed embedded system that is part of a fingerprint recognition/authentication system based on minutiae points. The system extracts the local characteristic of a fingerprint which is minutiae points in template based.Templates are matched during both registration and verification processes. Therefore, Fingerprint Recognition using Minutia Score Matching method was used for matching the minutia points before attendance is recorded. This School Monitoring System provides continuous vigilance throughout the whole day. This is implemented using a web camera which live streams a particular class in the school whenever required. The developed system is very helpful in saving valuable time of students and lecturers, paper and generating report at required time. The system can record the clock in and clock out time of students and workers in a very convenient manner using their fingerprint to prevent impersonation and reduce level of absence. Also, it reduces most of the administrative jobs and minimizes human errors, eliminates time-related disputes and helps to update the enrolled information into the Cloud(Nimbus) and maintain attendance record which cannot be erased or modified but can be retrieved whenever required through the android application developed

VI. REFERENCES

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