

Design and Implementation of an Intelligent Biometric Attendance System using IoT

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Abstract - Administrators of entire world and academic institutions in our country are concerned about regularity of students in school or college. The student's overall academic performance is affected by the presence of the student. There are two traditional ways to attend mainly and they are by calling students' names or by signing the students on paper. They are usually time consuming and incompetent. Therefore, an intelligent student attendance management system is needed which will help the faculty to maintain the presence of attendance. Thus, in our paper work, we have designed an intelligent biometric attendance system using IoT, in which the biometric authentication method used by us is Fingerprint and Arduino Uno is used as the microcontroller to which the fingerprint sensor and other components are connected. After the attendance is approved by the fingerprint sensor, it is sent to the website where it is used for displaying in various ways. The attendance on the web page can be viewed either according to a particular date, for checking how many students were present on that particular date, or through student id, for viewing the percentage and total attendance of that particular student with all the entries, and also the entire percentage presence of all the students can be viewed through the total attendance menu.

Keywords—Biometric Attendance, Finger Print, IOT.

1. INTRODUCTION

Web of things, usually contracted as iot, is a system of interconnected physical gadgets, for example, pcs, vehicles, home machines and different frill, for example, electronic gear, programming, remote sensor systems [1-2] and availability (required by the web) interface with any of these items together, to convey and trade information make able. Everything can be uniquely identified Through its root computing system and can work easily in the existing internet infrastructure. Iot permits articles, for example, home apparatuses to be controlled and controlled remotely on the internet, which opens the entryway to open doors.

For joining of these things, which are parts of the Physical world in pc put together frameworks with respect to the internet, the entryway opens opportunities for coordination of these things, which are segments of the physical world in pc based frameworks, other than less human impedance, productivity, exactness and increment financial advantages. Review of iot is appeared in fig. 1.1. Iot can be enhanced with sensor.

Which enables sensor information to be transferred legitimately on the internet, which can be utilized to control gadgets remotely according to the necessity. This innovation is in effect generally utilized in smart grid, smart home, smart city and power plant [3].



II. Literature survey

As we are moving towards day-to-day digitization and novelty is spreading, the current period is rapidly becoming more and biometric innovation is affecting human life. Different biometric advances, for example, unique mark, face, iris, retinal examples, hand marks, voice, signature and so forth approve acknowledgment through traits. These strategies utilize individuals' biometric information and are concentrating on the validation technique for the unique individual. The biometric recognizable proof technique is more advantageous than some other strategy utilized up until now, for example, id card punching. The biometric verification strategy utilizes information taken from individual estimations of people. This kind of information is interesting to the individual and continues as before for the duration of the life [4].

In 2008, in an exploration complete and composed on the executives of time and participation in the procedures of Nucleus Research, the work done by the analysts proposed the utilization of a participation the board framework which was automated and was intended to limit human inclusion, the error in the passage of information done by people and furthermore the tedious work. He said that the framework planned by him could expand profitability, decrease the missteps in finance, result in decrease of extra time, could prompt minimization of paper costs, and give the reports when requested. In the work, teachers need to stamp their participation through paper-pen strategy and need to record record of participation and put them in the PC. As may be, in this way, in addition, there may be an issue of mix-up in the section of partnership information [5].

Jain et al has created an app for work area or PC. [6], in which the total detail of the understanding listed for the specific curriculum will be shown, when the speaker will start the application. The partnership is set by clicking on a checkbox next to the name of the available understanding, and then tap the register summary to stamp their essence. As may be, in this way, in this way, human involvement is essential to denote the involvement of those who understand. Another technique, like the above strategy, was proposed, however all the things that were considered were needed to understand their own participation through a client server program from their personal PC or workstation. [7].

The above proposed actions, the way to get a partnership set through an intermediary is eliminated in the first and second offers, because every employee in the staff will see almost certainly, although the third proposal is understood by an image program is taken. Despite the fact that the above proposals are far less effective, the use of PCs has a change and improvement in the structure of simple involvement, which simplifies the ability and treatment of information to some extent.

ATTENDANCE METHOD BY BLUETOOTH-

In the year 2013, Vishal Bhalla, Tapodhan Singla, Ankit Gahlot and Vijay Gupta [14] proposed a participation framework utilizing the Bluetooth innovation where the participation of the understudies was taken through the cell phone of the staff here an application introduced in the cell phone of the personnel will inquiry every understudy's cell phone through Bluetooth correspondence and the MAC address of understudies is then sent to the workforce on the off chance that the MAC address matches, at that point the understudy participation is endorsed The issue in this work is that the understudy's participation could be stamped regardless of whether the understudy is absent in class and the telephone is with another person since just nearness of cell phone is the main prerequisite for the participation. Unique finger impression-based attendance system-

In an article, M. K.P. Bashir and C.V. Raghu has arranged a unique Finger Impression framework that is used for the purposes of partnership. Insert dies can attach their fingers to the gadget's sensors and stamp their quality.

They specially, special icon modules, RTC, Catch, LCD, Memory, and so on. And with the help of a microcontroller (PIC18F4550) with a GUI app on the host PC and with different parts with a hand held and controlled gadget. Due to the involvement of officials, the understanding of the PC database is used for exchanges.. [9]

Seema Rao and Prof. K.J. Satoa, Claus has proposed another way for the participation of officers using unique fingerprints as biometrics. In their proposed structure, fingerprints are examined by the use of exposed extraction system and the entire process of participation is mechanized. It separates the highlights of the person who has set their finger, and contrary to those who participate in databases and mark the partnership [16]. Neha Verma, Komal Sethi and Megha Raghav proposed a unique icon based ID framework for understanding check. In the proposal, the unique icon layout reduces coordination time from the division of the database. A unique mark scanner is utilized to enter the finger impression of instructors/understudies into the PC programming. [14]

Devil Jane, Dr. P. s. Ramkumar and Dr. K.V. Sairam has proposed a biometric framework for participation, where the unique information of the customers enrolled with an ID is sent to the database on the web server. [1]

In the works carried out by Piyush Devikar, Ajit Krishnamurthy, Aditya Bhange and Mohit Singh Chauhan, an IoT based framework has been planned, where the understanding of participants is stamped and put into the Google cloud. At that point, when the participation by the customer is punched, at the point of its stockpiling, a unique mark is confirmed by the fingerprint sensor and if the finger impression is coordinated, the partnership was endorsed on Google Cloud and Transferring is considered a spreadsheet, which can be seen to check for participation whenever desired. [3]

III. Proposed work

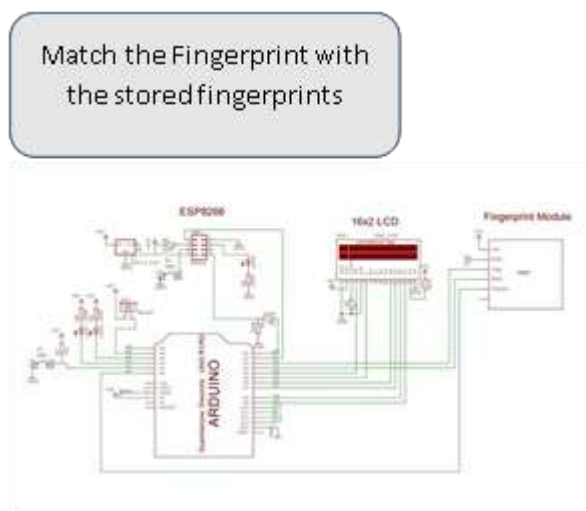
We have structured a biometric partnership structure using IOT, where the involvement of understanding is to be transferred to a database, through which the partnership can be viewed on the website page whenever you want. We have structured the site page so that when it is received, the customer can see the understanding in three different ways. The primary technique for reviewing participation is by selecting a date of Selection Debt Segment, in which the amount of display will be understood on that particular day.

In other words, we can see the partnership through a given client ID for a specific understanding, which will show understanding of all the participants and understand the

understanding of understanding. In the third way, we can see partnership with a considerable number of intelligences.

In our framework we have expected that 5 understand, and we have removed an ID related to every sensible and every ID, we have removed the number and name in the database, which will be displayed against every mysterious website Looking at the part on the page. The work we offer is a combination of both equipment and programming. The tool is to show the sensor information and additionally to detect information from the unique fingerprint sensor. It is used to connect with the web and send information to the site page, while in the product section, we have planned a site page in PHP which is a dynamic server page and used to see the involvement of the critiques Goes.

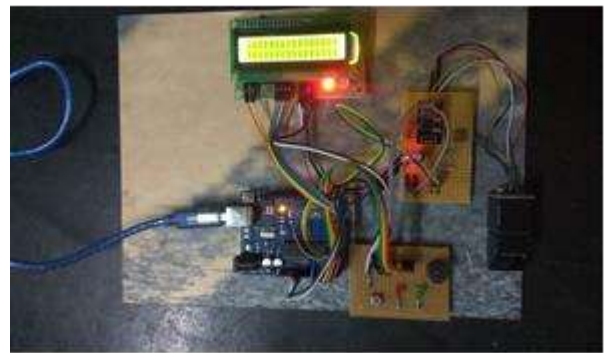
Framework was structured in different stages, from device to site site structure and their subtleties were given below.



IV. Testing

HARDWARE TESTING

Unique mark contribution framework utilizing IoT was planned on the speck board, which was later stuck on the cardboard sheet. Dab board has been utilized on the grounds that it enables us to effectively and various parts of various segments together on the grounds that there are openings under which copper is a decent channel, along these lines enabling simple access to the association gives. After adding all components to the board, we checked whether all components were working properly by supplying the adapter cable and found that all the apparatuses were working properly.



V. Results

The site planned by us is appeared in Figures. At the point when our framework is on, it will comprehend the client's finger or thumb with unique finger impression sensor and will look and interface with the Wi-Fi module arrange, and after the effective association of the Wi-Fi module the Internet, it is the information on the website page Will begin sending. The site page indicates information in three different ways, which are shown through different screen captures of the pages underneath.

Select Date for Attendance

Select Date :

The principal technique to take a gander at the present is appeared underneath the figure 4.2, by choosing a date from the chose date segment, which will demonstrate the quantity of understudies present on that specific date. As though we select the date 24/05/2018, it will demonstrate the participation of the considerable number of understudies present on this date, the client ID and participation with the season of participation. For instance, an understudy with User ID2 entered the class at 10:56:17, the understudy's name is Rinku and his move number is 851. This figure demonstrates that three understudies were available on the chosen date.

In the second type, as shown in figure 4.4, with the help of user-id we can see presence, which is provided to a student like 1,2,3,4, user must enter the student id whose attendance is to be seen.

Select User for Attendance

Select User :

Fig: Select user ID column

Subsequent to tapping on the submit catch, the client is diverted to the second page, which will show the absolute participation of the understudy and furthermore on every one of the dates and time at which the understudy has denoted his quality. It will likewise demonstrate the all out participation of the understudies and the all out participation of the understudies just as the percent participation of the understudies.

IOT Attendance System

Attendance By User : 1

Time	User	Roll no	Name
10:07:12 08/05/2018	1	850	Ravinder
13:41:42 14/05/2018	1	850	Ravinder
01:54:47 17/05/2018	1	850	Ravinder
10:08:30 18/05/2018	1	850	Ravinder
10:02:39 24/05/2018	1	850	Ravinder

No. of days present = 5

Total Working Days = 6

Attendance(percentage) = 83.3%

Fig: Attendance through user ID

Total Attendance

Fig: Button for Attendance of all Students

IOT Attendance System

Total Attendance

User	Roll no	Name	Attendance	Percentage
1	850	Ravinder	5	83.3%
2	851	Rinku	3	50.0%
3	852	Ruchi	5	83.3%
4	853	Mogha	3	50.0%
5	854	Shweta	3	50.0%

Total Days = 6

VI. Conclusion

The biometric participation framework is fit for showing the participation of the understudies with no disappointment gave that we have a safe web association. The framework has been effectively tried by us and the outcomes are gotten and consequently the proposed work has been practiced effectively the biometric participation framework is fit for showing the participation of the understudies with no disappointment gave that we have a protected web association. The framework has been effectively tried by us and the outcomes are gotten and thus the proposed work has been cultivated effectively.

References

- Sharma, Sandeep, Jitendra Singh, Rahul Kumar, and Abhilash Singh. "Throughput-save ratio optimization in wireless powered communication systems." In 2017 International Conference on Information, Communication, Instrumentation and Control (ICICIC), pp. 1-6. IEEE, 2017. DOI: 10.1109/ICOMICON.2017.8279031
- Kumar, Rahul, and Abhilash Singh. "Throughput optimization for wireless information and power transfer in communication network." In 2018 Conference on Signal Processing and Communication Engineering Systems (SPACES), pp. 1-5. IEEE, 2018. DOI: 10.1109/SPACES.2018.8316303
- Piyush Devikar, Ajit Krishnamoorthy, Aditya Bhanage and Mohit Singh Chauhan, "IoT based Biometric Attendance System", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 5, Issue 2, Dec. 2016, ISSN 2319-5940, pp 10-13
- Choudhary, Gaurav, Abhilash Singh, Rahul Kumar, Bipul Kumar Singh Deo, and Amit Sehgal. "Energy Efficient Distributed Clustering Algorithm for Improving Lifetime of WSNs."
- Research note, Automatic time and attendance: low hanging ROI, Proceeding in Nucleus Research, January 2008.
- S. K. Jain, U. Joshi, and B. K. Sharma, "Attendance Management System," Masters Project Report, Rajasthan Technical University, Kota.
- M. Mattam, S. R. M. Karumuri, and S. R. Meda, "Architecture for Automated Student Attendance," in Proc. IEEE Fourth International Conference on Technology for Education (T4E 2012), pp.164-167, 18-20 July 2012, doi: 10.1109/T4E.2012.39.

8. M. Strommer et al., Smart NFC Interface Platform and its Applications, in T. Tuikka and M. Isomursu, (Eds.), Touch the Future with a Smart Touch, 2009
9. M. K. P. Basheer and C. V. Raghu, "Fingerprint attendance system for classroom needs," in Proc. India Conference, 2012 Annual IEEE, pp.433-438, 7-9 Dec. 2012.
10. BISAM-BIS attendance Management System by BIS Software Development Services PVT Limited. [Online]. Available: <http://www.softwarehouse.co/school-attendance-brochure.pdf>