ATTENDANCE ANALYSIS USING RASBERRY PI AND K-MEANS

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ABSTRACT: In many organizations, colleges and schools attendance plays a major role. In any organizations calculate the employee's salaries based on the attendance and in the student perspective attendance is important factor to promote to higher classes. But they maintains the attendance manually .this results may increase the manpower and duplication of work. In this paper, to overcome those problems record the attendance and attendance analysis is done automatically using raspberry pi and RFID technology and use fingerprint for authentication.

Fingerprint-based attendance system ensures that there is a minimum fault in gathering attendance and reducethe time and cost required to manage attendance by paper and also reduces human effort and making the process very simpler by using raspberry pi. The timing is set to fingerprint sensor and that is connected to the raspberry pi. Then those attendances are gathered from the server and apply the data mining algorithms like KNN to know the overall class percentage who promote to final exams or higher classes. It also contains the feature that is the attendance message is sent to the authorized person through an e-mail.

1.INTRODUCTION

Attendance system plays a vital important role in an education system. The student's attendance percentage decreases due to irregularity. This will make a problem of student life. Attendance indicates that the Presence of a person in a school, college and working place. Now-a-days percentage of attendance is the major issue in the education system. To maintain perfect attendance, here we use an automatic mail processing system. In a day to day life, we are using any one of the biometric sensor (face recognition sensor,Iris sensor, thumbprint sensor, brain mapping sensor etc) for the presence of a person like in or out.To avoid the problems with the attendance we are going for biometric sensor using an e-mail. Here we are using a biometric sensor as a thumbprint sensor. After entering into any working place or educational institutions Each and every member has to give their fingerprint for their attendance and how much time they are present in that place. It compares the current fingerprint by using raspberry pi withfingerprints those are already in the database. If it matches then the attendance with time is send to the authorized person's mail automatically. By this we can reduce the time and it makes the process easy and efficient. And we collect the all member's attendance information from raspberry pi ten

apply the K-means technique to divide members information into particular groups based on departmentor class (in any working place or institutions) etc. By this information we can analyze the attendance report in monthly manner, which helps calculate the salary based on number of working hours for employees and promotion to higher classes or final examinations forstudents. In this paper, we are going to discuss on the various sections as follows. Section II describes the Literature survey, section III gives proposed system, section IV givessample results, section V describes the conclusion and section VI describes references.

2. LITERATURE SURVEY

Actually the basic version of the attendance system is taking attendance through paper in each and every class. This may lead to take more time and confusion with this wrong attendance system and we may do some mistakes while analyzing the attendance, also add fraud attendance to a student sometimes. So this attendance system is not genuine one. The enrollment of student fingerprints is another way of attendance system. Enrolling is a one-time process. The student's fingerprints are stored in a database of fingerprint sensor. After taking the thumb impression, it will compare with the current fingerprint. If it is matched then attendance of each student is displayed on LCDand at the same time, the attendance will be updated in the database. The database will maintain all student records. This process is done through the Wi-Fi server. If a student attendance percentage is decreases or below the range then they will get a message to their mobile through SMS.

In the research of the attendance system, raspberry pi technology is used to build an economic biometric system. Raspberry pi is a microcomputer with abilities of Personal Computer. By using biometric technology, IOT based biometrics were used. The biometric information is encrypted and stored on the cloud. The authentication will be created through biometric services as host on cloud. But it does not give the printouts automatically. The RFID tag is an electronic tag. This is used to send the printer. The RFID technology is based on the process of attendance system. This system doesn't send printouts automatically. Here the biometric sensor compares the digitized fingerprint with present fingerprint then it will send the document to the mail automatically to take printout. The attendance database is stored on the server.

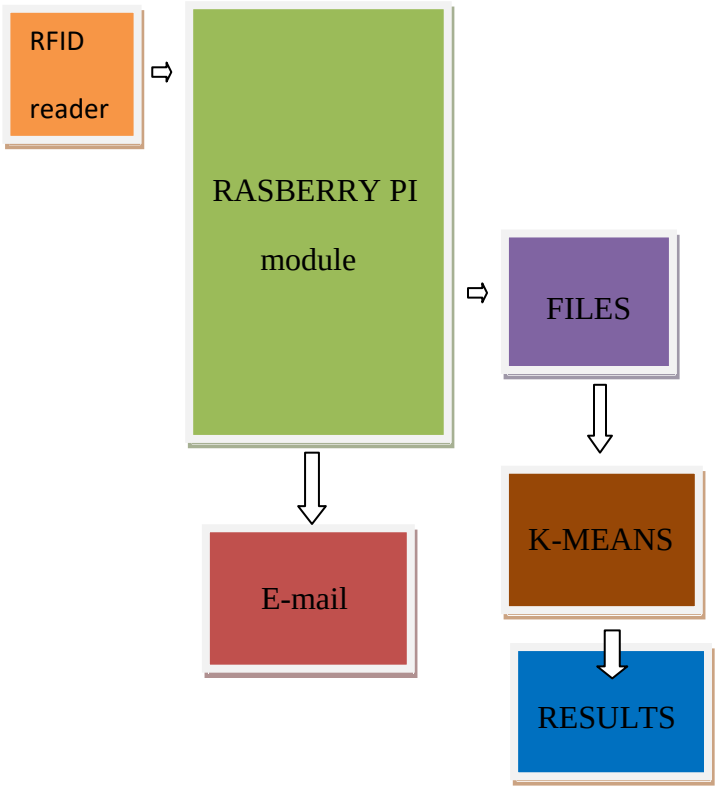
3. PROPOSED SYSTEM

The Fingerprint authentication is one of the most accurate and popular technology. Here we use RFID technology for this. This fingerprint system is connected to the raspberry pi web server. Initially the timing is set for fingerprint for student attendance. The whole college or school students put their fingerprint on a fingerprint devicethenthat timing message is sent to the authorized person's e-mail daily. And gather the all student's attendance information from raspberry pi web server by month by month or quarterly or half yearly etc then apply k-means machine learning algorithm to group the students based on the same

class or same group. Then we will get the overall class percentage of the students together. This will helps who have less attendance and who promote to final exams or higher classes etc.

In the case working place, gather all employees attendance information from raspberry pi server by month and apply K-means algorithm to group employees based on the designation or department or joining date etc and then calculate the salary as their organization rules.

BLOCK DIAGRAM

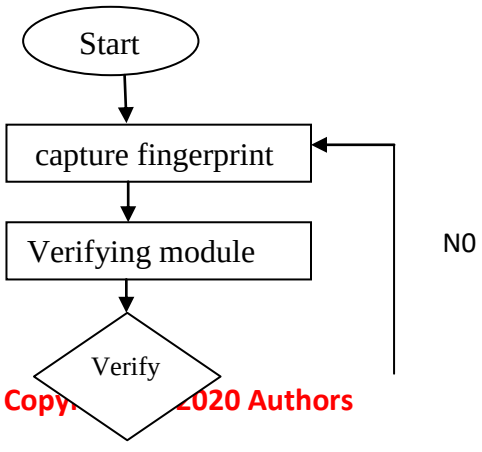


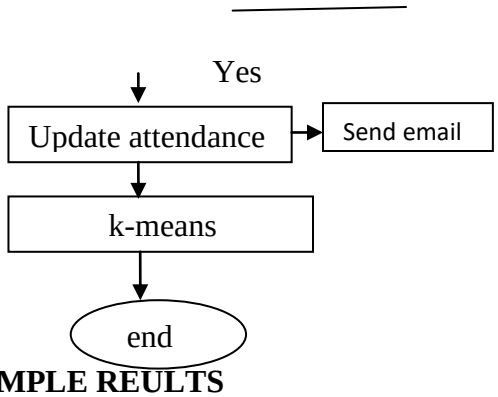
Raspberry pi module contains the segmentation of storage and Bluetooth module. It stores the digitized information of the fingerprint of a each person. When thumb printing on the sensor is over thenthe Biometric sensor is used to digitize that information.Raspberry pi module compares the current thumbprint information with the stored thumbprint information. If the time is out for the attendance then it considered as late attendance.After five minutes, the attendance report will send to the authorized person's e-mail. Based on our requirement with respect to months the final report is generated by applying K-means algorithm to that data that is taken from raspberry pi web server.

ALGORITHM

1) The data set collected from raspberry pi module.
2) That dataset is treated as input for k-means clustering algorithm.
3) Then data is divided into k-clusters, where k is predefined.
4) Randomly consider one point as cluster center.
5) Assign each value or object to the cluster based on the *Euclidean distance*.
6) Calculate mean or centroid for each cluster.
7) Repeat the above 4, 5, 6 steps until all objects are placed in any one of clusters.

FLOW CHART





4. SAMPLE REULTS

The following are attendance datasets of 5 students taken from raspberry pi for 5 days having 7 periods per a day.

```
Day 1-Data set :
{1,"roy","cse",7,2,"john","cse",7,3,"merley","cse",0,4,"patel","cse",7,
5,"ruhi","cse",7}

Day 2-Data set :
{1,"roy","cse",7,2,"john","cse",0,3,"merley","cse",0,4,"patel","cse",7,
5,"ruhi","cse",4}

Day 3-Data set :
{1,"roy","cse",7,2,"john","cse",7,3,"merley","cse",7,4,"patel","cse",7,
5,"ruhi","cse",7}

Day 4-Data set :
{1,"roy","cse",7,2,"john","cse",4,3,"merley","cse",4,4,"patel","cse",7,
5,"ruhi","cse",0}

Day 5-Data set :
{1,"roy","cse",7,2,"john","cse",7,3,"merley","cse",0,4,"patel","cse",0,
5,"ruhi","cse",4}
```

R.No	Student name	Branch	Attendance	Attendance %
1	Roy	Cse	7,7,7,7,7	100
2	John	Cse	7,0,7,4,7	71.4
3	Merley	Cse	0,0,7,4,0	31.4
4	Patel	Cse	7,7,7,7,0	80
5	ruhi	Cse	7,4,7,0,4	62.8

These 5 days attendance are given to k-means cluster algorithm then it creates 3 clusters

```
Cluster 0:  2 {1, 4}      ----att>=75

Cluster 1:  2{2, 5}       ----att<75 && att>=60

Cluster 2:  1 {3}     ----att<60
```

The following is a tabular data for attendance

5. CONCLUSION

We are implementing attendance analysis system by capturing the attendance using raspberry pi technology. This technique successfully authenticate user and update the attendance in the database correctly and then sends a mail to authorized person and also it gives the attendance percentage for a couple of months. By this we can eliminate mistakes, man power, reduce time and fraud attendance adding is also not possible.

6. REFERENCES

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