Student Performance Analysis and Biometric Attendance

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Abstract - **In today's time, the performance of the student is decreasing gradually. Because of this unemployment in our country is increasing at a very high rate. So, we need to analyze the performance of a student and increase the efficiency of a student. In this project, we have taken various factors that affect the performance of the student. In many schools and colleges, the traditional method is used to record attendance. Later all the data is entered in computer and aggregate attendance is calculated. Due to this data redundancy, inconsistency and data insecurity occurs and also the attendance of latecomers and absentee students are marked. In our system Initially, the teacher's authentication is important to start the portal and then student's attendance is taken. In this system, attendance is implemented using Arduino. A web application is created using Python scripting. The advantage of this method is that the attendance of latecomers is not marked. It is user-friendly, more secure and there is no data redundancy or inconsistency and affordable.**

keywords - **Data redundancy, Python language, Authentication, Prediction, Machine learning**

I. INTRODUCTION

In an education system, attendance plays a vital role. Vital role in terms of giving them term work marks, predicting the students level in academics of a particular system. And predicting many of different things which we will discuss in the paper further. So, the question arrives how to manage the attendance of the students. Till date many of the institutes use traditional method of marking attendance which is calling the name or roll call of the student and marking the attendance, or else passing a sheet which contain the names of the students and students are required to mark there attendance by signing the sheet but all this method consume time and wastage of the papers. And predicting anything from it manually becomes difficult. And many a times the record we get may not be correct as many students can give fake attendance which will make our records inaccurate. So, to overcome these issues we are going to implement a different method for marking attendance and analysis students' performance.

We are going to take biometrics of each student to mark attendance and analysis their attendance and performance. As we know biometrics is the most secure way as none of the students could have same biometrics, each and every human on this earth have different biometric so we could use those for creating a secure way to mark attendance and analysis performance of a student.

II. LITERATURE SURVEY

After doing analysis on the recent work done in attendance and performance analysis, we found that many people used different methods to mark attendance such as RFID, biometrics, etc. A system used biometrics-based attendance system which reduced efforts for marking attendance [1]. And also, this kind of system worked well in all the cases but there were some issues with them, such as the student could mark his/her attendance anything even if he/she is late. Also, certain systems used Arduino and a single board computer with fingerprint biometrics [9]. In such system the idea was to centralized the management system. And some systems used Arduino and raspberry Pi for attendance recording [10]. Such system implemented attendance recording and consolidation with the help of raspberry Pi and Arduino. But, after a certain extent only marking attendance was not a key point as being an engineer no one is happy with doing a small kind of work so there came idea of managing the performance of the student using such kind of data and a new thing came in market known as STUDENT PERFORMANCE ANALYSIS. So their were certain researches in the field of student performance analysis. One of such research was student performance analysis system (SPAS) [2]. It was totally based on online web-based software that makes the teacher to track student performance by their data and provide the result by means of grading system. And then there came some machine learning algorithm such as decision tree [3]. Using such type of algorithm and data mining technique one can analysis performance of the student [4]. Also, some people tried to make the performance analysis using some hybrid machine learning algorithm [6]. As for machine learning the first requirement is dataset so for that people used k-means algorithm [5]. And all this thing required some hardware setup which is provided by the help of Arduino, fingerprint sensor, and other peripheral. Using Arduino is the best thing as it is very well to be used as tool for research and study[8][7].

III. EXISTING SYSTEM

Countless approaches have been done for making these kinds of system which gives attendance which is fully secure and correct. Profuse number of systems have implemented biometrics, RFID, etc. system, but research found that biometrics was the best way out for marking attendance as for that the person needs to be present. As while using RFID card anyone can go and scan the RFID card and mark the attendance. In current biometrics-based system, the attendance of any student is marked if he/she is

on time or late. Also, in performance prediction system there were no feedback of the teachers and attendance did not play a role in performance analysis system.

IV. PROPOSED SYSTEM

The propound system consists of arduino, fingerprint scanner, wireless sensor. The fingerprint scanner is used to take the biometrics of the student and then in the backend the processing of the biometrics is done and the fingerprint in checked if it matches or not. But in our system, there are certain changes as we wanted to make a system which is most accurate and fraud free. So, we have made a change in which first the lecturer is required to give his/her biometrics to start the attendance portal. And after that only the system takes the biometrics of the student and mark the attendance. And the portal closes as soon as the lecturer again provides his/her biometrics. Using this we have benefits as:

1. The attendance of the late comer can't be marked.
2. The attendance of the lecturer can also be marked and one can get to know how efficiently the lectures are going on.

Now, comes the part of analysis:

As we are required to predict the performance report of a student, we would require certain inputs such as student marks, attendance, teachers' feedback. Using these factors, we are going to predict the performance of a student. For any kind of performance analysis related to student the main factor is the student's precious marks as according to marks one can judge student's knowledge. Also, the attendance plays a vital role as if the student is not attending the classes so one can say that the student is having low knowledge if also, he/she is getting low marks. But if the student is attending the class regularly and still his/her performance is not great then we need to check the performance factor related to the teacher that if he/she is taking classes regularly and what are the feedback given to them by the student.

So, using these factors and some machine learning algorithm we, are going to predict the performance of a student.

V. SYSTEM ARCHITECTURE

1) Enrolling students' and teacher fingerprint

Step 1: First, the student needs to go to the administration office and enroll his/her fingerprint.
Step 2: Now, the fingerprint is extracted.
Step 3: All the personal details are taken.
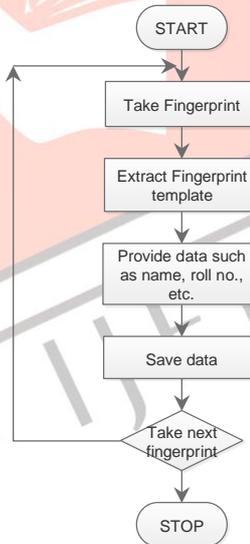Step 4: Now all those data is saved in the centralized system.

Fig 1:- Biometrics enrollment

2) Using fingerprint as a biometric to mark attendance

Step 1: First, the lecturer comes in the class and provides his/her biometrics to start the attendance portal.
Step 2: Now, the students' in the class provide their biometrics to mark their attendance.
Step 3: If the students fingerprint is enrolled in the system then his./her attendance is marked.
Step 4: Once, all the student in the class have provided their biometrics then the teacher needs to provide his/her biometrics to stop the portal.
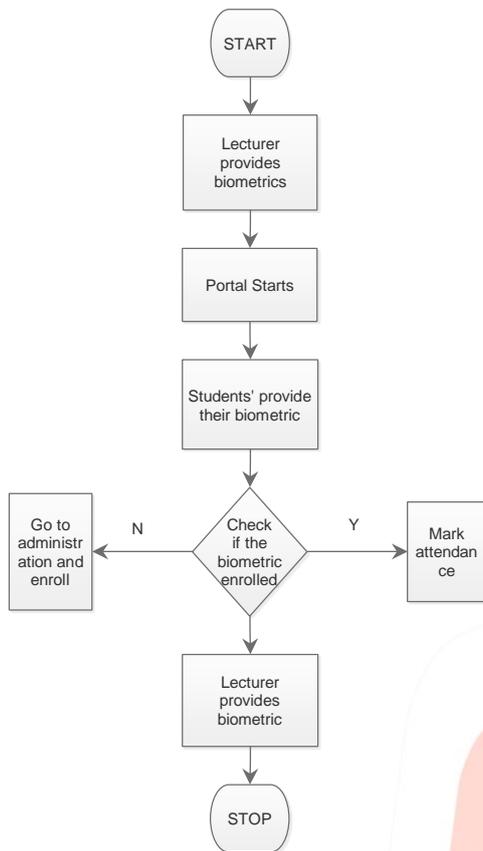
```
          ┌─────────┐
          │  START  │
          └────┬────┘
               │
        ┌──────▼──────┐
        │  Lecturer   │
        │  provides   │
        │  biometrics │
        └──────┬──────┘
               │
        ┌──────▼──────┐
        │Portal Starts│
        └──────┬──────┘
               │
        ┌──────▼──────┐
        │  Students'  │
        │  provide    │
        │their biometric│
        └──────┬──────┘
               │
   ┌──────┐  N  ◇        Y  ┌──────────┐
   │Go to │◄────Check────►│   Mark   │
   │administr│  if the     │attendance│
   │ation and│ biometric   └──────────┘
   │ enroll  │ enrolled
   └──────┘    ◇
               │
        ┌──────▼──────┐
        │  Lecturer   │
        │  provides   │
        │  biometric  │
        └──────┬──────┘
               │
          ┌────▼────┐
          │  STOP   │
          └─────────┘
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Fig:- Marking attendance

3) ACKNOWLEDGEMENT

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4) CONCLUSION

In today's time, technology is getting more and more improved. Biometric is an effective tool to detect fraud activities. The proposed system made in the above discussion could be used in offices and colleges to get to know the real time attendance of the employees or the students and the marking of fraud attendance could be stopped to a great extend and a clear and fraud less attendance system is made. Also using the techniques for performance prediction, we could predict students' performance. And here we conclude with our system for marking biometric attendance and predicting performance

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