Android and Bluetooth Network based Approach to Detect Students: using AI (Student Attendance System)

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Abstract— **This system approach is used to spot the students throw the Smart phones by using network. This system is taking the particular number which is attendance in class. The Student attendance is very important because so many successful industries, schools and Universities want to engage the students and making sure that they will come regularly in the school. Automated Attendance System performs the daily job of attendance marking and analysis with reduced human intervention.**

In this research paper the student attendance system is designed and implemented based on the Android operating system and Network. In comparison to other attendance system this system provides the faster, cheaper, and ONE TIME ATTENDANCE And generate the daily, monthly and yearly reports. Maintenance and monitoring of attendance records plays a needed role in the analysis of performance of any organization.

Keywords—Android, Engage, **human intervention***,* **ONE TIME ATTENDANCE***, Monitoring, job-activity, needed-vital*

I. INTRODUCTION

The technology advancements and increase in internet the student attendance system is taking the particular number which is attendance in class. Successful industries, schools and universities begin by engaging students and making sure that they will come regularly so the attendance rate become very important.

The attendance is important because students are additional too likely to success in academics when they attend class consistently. It's difficult for every teacher who taking the lecture to build student's skills and progress if a large number of students is frequently absent.

Because of the advancement of technology today has dip itself towards education. The attendance of technology has reached its maximum of providing sustainable technology towards quality education through delivery and effective learning and smart devices have become a way of life especially in higher education academic fields be able to develop their paper attendance into smart attendance system. In this paper, we will not only explain the how is the work the automatic student attendance system but also identify the challenges and difference between our attendance system and other attendance systems associated with it and discuss reasons why attendance system implements this technique.

II. ANDROID OPERATING SYSTEM

Android is a software and application platform and operating system for mobile devices, based on the Linux kernel, and developed by Google and later the Open Handset Alliance. It allows developers to write managed code in the Java language, controlling the device throw Google-developed Java libraries. There are over 2.5 billion Androids in use and over 1.4 million devices activated every day. Android is the one of the most used mobile operating system with a market share of 87% and Over 2.9 million applications available in Google play store.

III. ANDROID FEATURES

- User Interaction**:** Android Provides pleasing, attractive and comfortable user interaction.
- Connectivity: Now a day's any Android supports different connectivity technologies like Bluetooth, Wi-Fi.
- Messaging: SMS and android cloud to device messaging framework is available in android operating system.
- Multitasking: Android supports multi-tasking, multi-programming, which provides flexibility of running from one application to another or running different applications simultaneously.
- Hardware Support: Android supports video or still cameras, touch screens, GPS, accelerometers, gyroscopes, magnetometers, proximity and pressure sensors, thermometers.
- Java support: Most of the android applications are written in java language but there is an absence of java virtual machine in the platform of that DVM is presented. DVM is specially designed for android and battery powered mobiles.

IV. PROPOSED OF STUDENT ATTENDANCE SYSTEM

A.   *System Tools:* Android Studio has been used for a development environment. Now a day's Java, PHP, HTML5 And CSS3 have been used as programming and scripting languages. While MySQL has been used for a Database management system. WAMP server has been used as a local host. And CSS as a icript for fine-tuning the screens appearance.

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B.   *System Database:* Database of the present system consists of five tables: users, students, courses, departments and attendance logs. Figure (1) shows these relational databases.
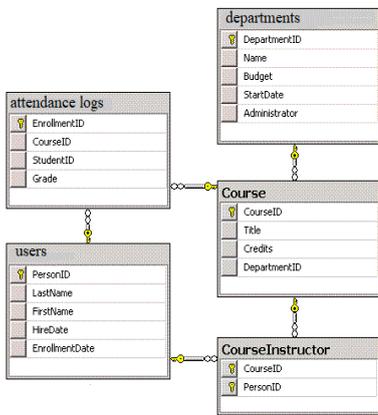

Fig-1-Student Attendance Database

C.   *System Users:* There are three types of system users: Administrator, Presenter and Instructor. Any user who wants to use the attendance system must get user name and password which admin afford it. This Automated Attendance system consist from three parts, first part is admin session, who can login to system and edit on all database tables. The second part is instructor session, who login to system for marking attendance and third part is presenter session, that also login to system to show attendance and report all these tasks. The homepage of this system is the login page. When user open this application then this application shows the login page to the student, as shown in Figure (2), It involves three input types: Text fields, button and labels. And Also, there are two textboxes for entering username and password
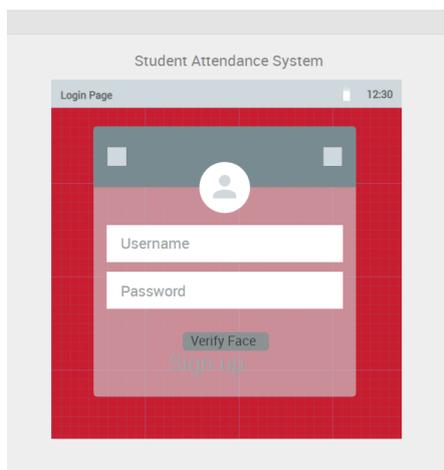

Fig-2- Login Page

D.   *Administrator Session:* After enter the user name and password, the application will redirect the admin into the "Dashboard" page. It holds the buttons for Department, Courses, Users, students and logout as shown in figure (3).

These buttons are used for adding, deleting and editing the department, course, student and user respectively. The proposed of this system is, suppose that current academic system consists of four classes, and two semesters. Figures (4), (5), (6) and figure (7) shows managing these sections.
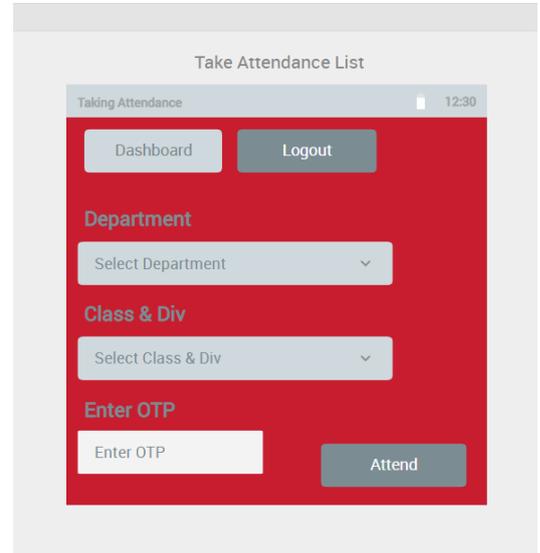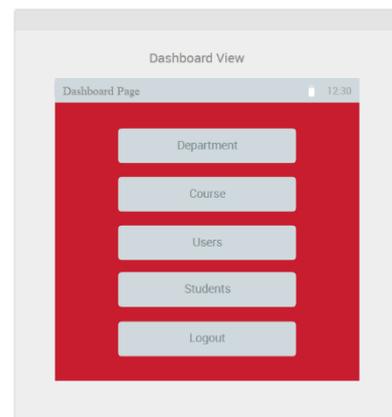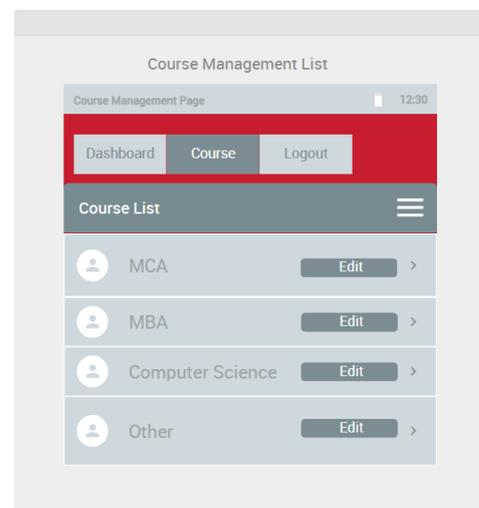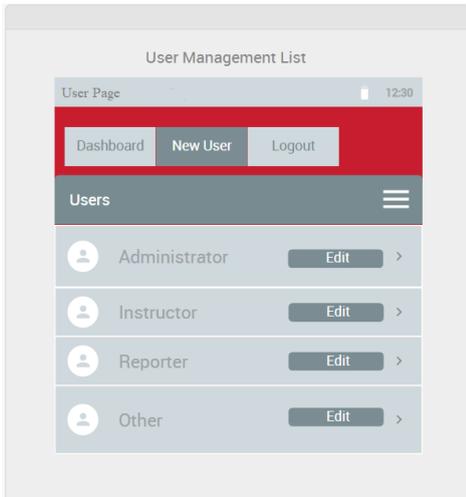

Fig-3- Dashboard View

Fig-4-Course Management List

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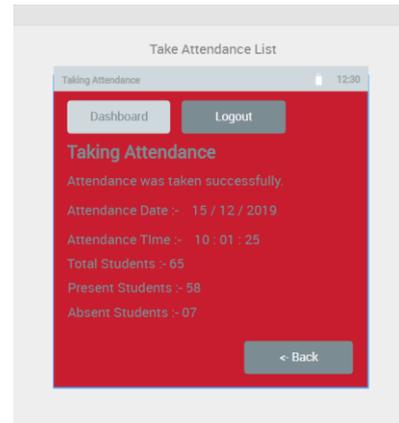**ICSITS - 2020 Conference Proceedings**

Fig-5-Users Management List

E. ***Instructor Session:*** For taking the students attendance for particular department and class, instructor must be login to the system. After submitting the user name and password of the instructor, the system will redirect that instructor to "take attendance" page as shown in figure (8). After selecting the department, class, semester, and the current course, all names of students at that class will appear in students list as shown in figure (9).

Fig-6-Department Management Page

Fig-7-Taking Attendance Page

Fig-8-Student Attendance Page

After taking an attendance, a statistics page will be shows to acknowledge an instructor about both present and absent students, as shown in Figure (10).
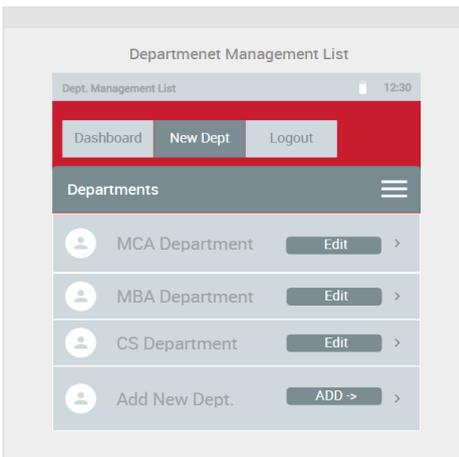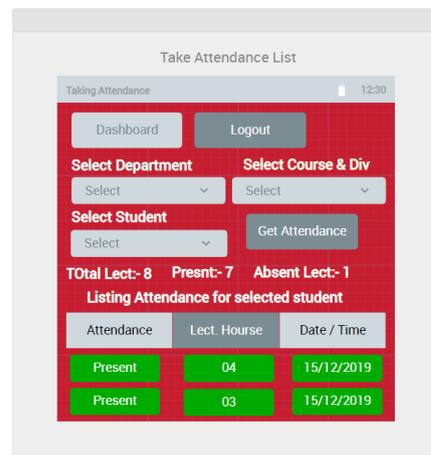

Fig-9- Attendance Statistics Page
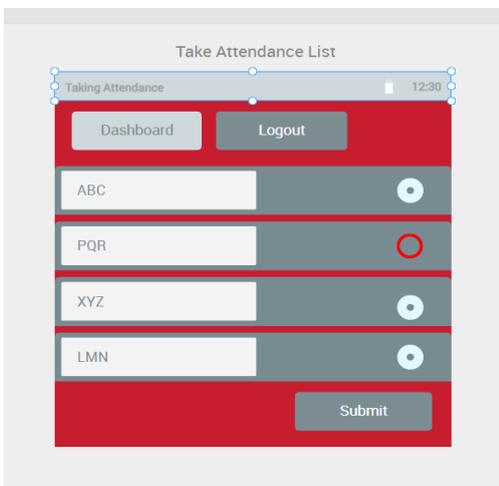
F. ***Presenter session*** : the third user of the system is the Presenter. The presenter is responsible for extract a report of attendance, for a particular course, as shown in figure (11), or student in specific course, as shown in figure (12).
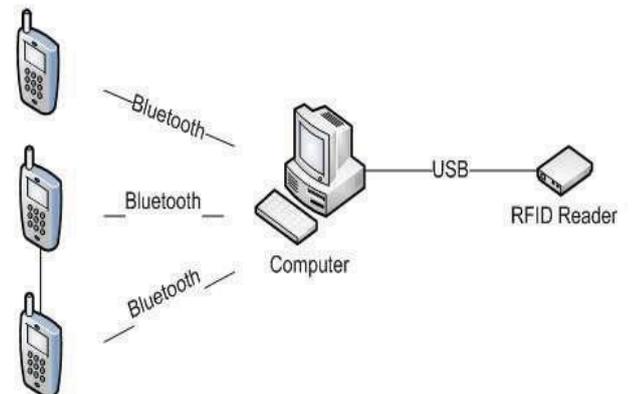

Fig-10-View Student Attendance Report Page

V.   ANDROID FEATURES

- User Interaction: Android Provides beautiful, attractive and comfortable user interaction.
- Connectivity: Android supports different connectivity technologies like Bluetooth, Wi-Fi, and WiMAX.
- Messaging: SMS, MMS and android cloud to device messaging framework is available in android operating system.
- Web browser: Browser present in android operating system depends on web kit in mix with Chrome's V8 JavaScript engine supporting.
- Multitasking: Android supports multi-tasking, which provides flexibility of running from one application to another or running different applications simultaneously.
- Hardware Support: Android supports video or still cameras, touch screens, GPS, accelerometers, gyroscopes, magnetometers, proximity and pressure sensors, thermometers.

HOW IT WORKS FRONTEND?

- Firstly, Install the app in lecturer and students mobile.
- When the new lecture begins the student will switch on the app and the student enter the username and password in login page and click on the to verify the student face in app.
- When the student username, password and most important thing student face verification is done successfully then student can login successfully.
- Then student go to the taking attendance page and it will select the appropriate information related to their academic year and attend their Attendance.
- The students who are present for the lecture can easily mark the attendance.
- Due to this, the time will be saved of the lecturer.

HOW IT WORK BACKEND?

The motive of the development of biometric system is to take student attendance more efficiently. This method uses the student's matrix card to route student's attendance and sent information to the computer and the computer will send data to a mobile phone lecturer. The listing of student's will be automatic, quicker and more security intensive than current methods of registration.

WHY TO USE BLUETOOTH FOR THIS APPROACH

While there are numerous other technologies' like WIFI, AIRPORT, INFRARED, ZIGBEE and many more but the key among them are range, power consumption, and

intended use. **Bluetooth** wireless technology in its most common implementations up to a range of 30 feet(10m). This range, depending on the **Bluetooth** device class, can extend to 100 meters and has been shown, in some tests, it supports an even greater range. **Bluetooth** technology consumes
a low amount of power and is therefore appropriate for smart phone and battery-operated devices. The technology provides voice, data, and audio connections between devices.

VI. REVIEW OF LITERATURE ON DIFFERENT ATTENDANCE MANAGEMENT SYSTEM

A.   Computerized Attendance System:

A desktop application developed by S. K. Jain, U. Joshi, and B. K. Sharma (2010), in which all the list of the registered student's in a particular course will be displayed when the lecturer start the application. The attendance is done by clicking a check box next to the name of the students that are present, and then clicked on register button to mark their attendance. But in this also, a human involvement for attendance tracking is needed.

Bluetooth Based Attendance System:

In 2013, Vishal Bhalla, Tapodhan Singla, Ankit Gahlot and Vijay Gupta , have proposed the attendance system which can take attendance using Bluetooth. In this project,
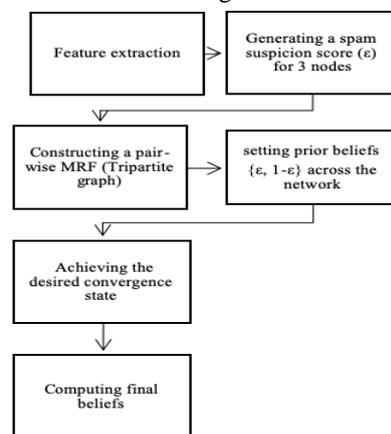

Fig. 1. Figure to show workflow in SpEagle framework

attendance is being taken using instructor's smart phones. Application software is installed in instructor's mobile telephone enables it to query student's mobile telephone throw Bluetooth connection and through transfer of student's

mobile telephone Media Access Control (MAC) addresses to the instructor's mobile telephone, attendance of the student can be confirmed. The Problem of this particular system is student's phone is required for attendance. If student didn't carry the mobile phone with him without mobile phone his attendance will not considered in Bluetooth Based Attendance System. The second problem of this proposed system is, in case of students' absent if his mobile is given to his friend then also present is marked, so attendance of student is not necessarily only phone should be in Bluetooth coverage area.

B.   NFC based Attendance System:

(Media Anugerah Ayu, "TouchIn: An NFC Supported Attendance System in a University Environment", 2014) In this paper author presents the implementation of an (AMS) Attendance Management System that is based on the Bluetooth and NFC technologies in a multiuser environment. It uses fingerprint & the Bluetooth address of the NFC enabled smart phone of the user to authenticate to identity of the user. A Java based desktop application receives the NFC tag IDs, other information associated with the mobile phone and the user and submits them to an analyzer for the interpretation of the user's behavior. But in this case, student must be having NFC enabled phone to mark attendance in the class room.

C.   Fingerprint based Attendance System:

In 2013, Seema Rao and Prof.K.J.Satoa proposed one new automated attendance system for employee attendance using fingerprint. This automated attendance system checks one fingerprint template with all templates stored in the database, like wise it checks for all employee which will take more time. The main problem in this case is it is very time consuming as it checks one fingerprint with all the temple stored in the database. (Neha Verma, Komal Sethi and Megha Raghav, 2013) Fingerprint recognition-based identification system is designed for student identification. This system is being designed for taking the attendance in institutes like NIT Rourkela. In this automated attendance system, fingerprint template matching time is reduced by the partitioning database. In this system all students of every class have to stand in a long waiting line to make attendance, again this system is suffering from fingerprint device, and one most important disadvantage of this system is that it is work within short distance.

D.   Iris Based Attendance System:

In 2010, Seifedine Kadry and Mohamad Smaili has developed one system. In this paper, a wireless iris recognition automated attendance management system is designed and implemented using Daugman's algorithm (Daugman, 2003). This system based on biometrics and wireless technique solves to the problem of the spurious attendance. It can make the user's attendances more easily and effectively. This automated attendance system is based on RF wireless technique, it is too expensive. In this system all students of every class have to stand in a long waiting line to make attendance, and most important disadvantage is that it is work within short distance and it is expensive automated attendance system.

E.   Face Recognition based Attendance System:

(Muthu Kalyani.K and Veera Muthu.A, 2013) has proposed Face Recognition based Attendance System, where we use a CCTV camera to be fixed at the entry point of a classroom, which automatically captures the image of the student and checks the observed image with the face database using

android enhanced smart phone. It is typically used for two purposed. Firstly, marking this automated attendance for student by comparing the face images produced recently and secondly, recognition of human who are strange to the environment i.e. an unauthorized person. For verification of image, a newly emerging trend 3D Face recognition is used which claims to provide more accuracy in matching the image database, the main problem of this system is recognized face will compare with the all entire database for the authenticate the individual attendance.
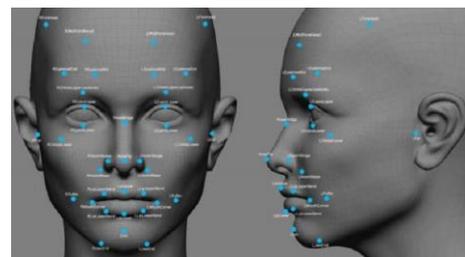
F.   Mobile Based Attendance System:

In 2013, Dr. S. Ramnarayan REDDY, Deepanshu GOYAL and Ankit BANSAL, tried to implement a system which overcomes the limitations of the existing approach by taking the attendance through teacher's mobile phones. Doing the same work on mobile phone not only saves our resources but also enables the user to get easy and interactive access to the attendance records of student's. This system is implemented on S60 Symbin platform, so teacher must be having S60 Symbin platform mobile phone and human involvement for taking the attendance there.

G.   RFID based Attendance System:

BISAM-BIS attendance Management System by

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BIS Software Development Services PVT Limited presents an attendance management for schools and colleges. This automated attendance system can send SMS and email alert to parents/guardians of the students automatically. The student will register at the gate by touching RFID device with their RFID tag and send the data to BISAM server in the school/college. The server will process the attendance data and send an SMS to the parents/guardians of the absentee of the student through BISAM SMS gateway server. The system also has Time Manager Software for managing the employee's attendance and HR related functionalities.

Solution: - As per the above cases in each case there is some problems. The 3rd and 6th case is Bluetooth based attendance system and Face recognition-based attendance system we combine these two systems and solve the problems and make the Android and Bluetooth Network based Approach to Detect Students: Using AI.

> **Proposed of System :-**

The proposed of automated attendance system is based on Bluetooth Network and face recognition algorithm. Another one purpose of this system is to solve the way of traditional attendance system and make the attendance system as automated. When the lecturer enters in classroom then the student can open this application and enter their username and password and verify their face in this app. In this feature the face recognition is only take the live student face it does not recognize the any type of images and also it does not recognize the video faces.

CONCLUSION

We covered almost all of the technologies in the Bluetooth attendance system and conclude that with the advancement of this technology and with the increasing demands of the people on new procedures are has been developed. It will be really beneficial for the students and as well as for the professors of the respective universities and colleges as with the advancement of this technology they can put to utilize their lectures in a best manner.

Therefore, we can conclude that in the future, we can consider Bluetooth attendance technology system as a good option in near future to meet the growing requirements of the generation in effective manner. The system is very easy to use. Users are directed as what step to take next by providing them with timely information displayed on their smart phones. Accidental touching of tags which may result in an unnecessary trigger is avoided since users need to deliberately connect to the terminal via Bluetooth first before the tag application is activated. The system is requiring minimal initial calibration to initialize which tag is used as Entry tag or Exit tag. The system is very useful in school/college environment, work places and any organization that requires strict authenticated and authorized users to be at the premises. Prediction of the unacceptable user/student's behavior is automatically sent to the administrator. This saves administrator's time from manually scrutinizing the system to make inferences from user's data.

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