Efficient and Smart Attendance System using Local Wireless Network

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Abstract: Marking attendance in any organization used to be troublesome due to use of pen and paper scheme. In past few years, organizations have switched to a new technology termed as 'Biometrics' for attendance. Though biometrics has made possible to save and process attendance records digitally along with a significant advantage of avoiding proxy signatures, it allows only a single person to punch attendance at a time. As the office opens, due to rush of employees and limited number of biometric devices, a lot of time can get consumed. In this project, we emphasize on eliminating the problem mentioned above. We are using smartphone devices of individuals so that many employees can mark their attendance simultaneously. We make use of wireless network for connecting server and employees' smartphones. This system has many benefits such as time efficiency, simplicity and secure authentication. The additional feature of this system is that the availability of the employee can be tracked throughout the working hours, as we are using local area network.

Keywords: Wi-Fi, Android application, Attendance marking and tracking

I. INTRODUCTION

Organizations around the world have hundreds of employees working for them and those employees do expect the compensation for their efforts during the working hours. For sure the organization has pay the employees for their hard work, but also it needs to know that whether an employee was available in the office during the working hours. For the above reason, the attendance system came into picture to help the organization detect the presence of an employee within the office. The most traditional approach for marking attendance is the Log-book system where the employees mark their attendance by signing into a registration book using pens. Though this system is quite simple, it cannot be termed as feasible due to multiple reasons. First, the system is quite cumbersome as the organization needs to maintain the records on papers; second, this system is a lot time consuming as the employees need to form a queue for marking their attendance in the book; third, someone else this project emphasizes on eliminating all the above-mentioned disadvantages of the available schemes. We introduce a new system which can be termed as efficient and smart as well as feasible for both the employees and the organization. We make use of opportunistic wireless network through which the employee would communicate directly with the database and would update the attendance while securely passing through the firewall of the network. Android is an open-source development platform which provides many easy on-the-go facilities for developing wide range of applications. As the Android Operating System (OS) is most popularly accepted across the globe, we choose to develop an Android application using which the employee would be able mark attendance. Our system would save time as many employees can mark their attendance simultaneously using their personal Android smart-phones, thus eliminating the 'Only one person at a time' disadvantage of the Biometrics. Along with efficiency and feasibility, our system also provides security as no one else other than the registered employee would be able to use the application for marking the attendance. We provide an additional feature using which the authenticated employee would be able to view the attendance record up-to-date. An interesting feature that we provide is that the organization can track the presence of an employee within the organization, so that the organization becomes assured that the employee does attend and work for the whole day within the premises. We make sure that our application could be used by any organization, thus helping mass population across the globe.

II. RELATED WORK

This section is review of few related systems and their different methods in recording attendance.

A biometric-based system, presents a remote iris acknowledgment attendance administration system, which is planned and actualized using the Daugman's calculation. This system utilizes the iris acknowledgment for confirmation and RF wireless techniques, especially for employee identification. Both of these systems are utilizing biometrics qualities which make them great approach against fake data. The obvious limitation of such biometrics based attendance system is that they cost a lot more expensive than a pure RFID based system. The attendance recording process in these systems would also be time consuming due to the fact that biometric scan would normally take a while for recognition and validation

process. In spite of this, we do not deny the importance of such systems in highly secured environment. Another approach was introduced in which the system promotes fingerprint based employees' attendance recording system with GSM utilization. By using this system, each employee attendance is validated once the employee's fingerprint is verified by the reader. In addition to the strict attendance verification and recording, the system will send weekly attendance report to the employee via GSM. An RFID based system is developed to record attendance during work hour as the employees enter the office floor. This system requires each classroom to be installed with an RFID reader that is connected to a computer. The RFID reader will be used to capture the employee information through the employee's card. To view the overall employee attendance, the organization head may later connect their phone via Bluetooth to the computer. Another project is also using RFID technology. However, this system requires an RFID reader to be mounted at the central of each office floor. The mounted RFID reader will track all RFID tags in the office floor at once and an object counter will update the number of employees in the office floor based on the successfully traced tags.

Above systems have the same drawbacks, which is the additional hardware cost to install the RFID devices. Even though RFID devices have become cheaper over the time, one whole RFID system does not just include readers and tags. Computer, cables, network or even a server might be needed in order to setup the whole infrastructure. The cost to setup the system from scratch can easily outweigh the cost of the RFID devices used in the system.
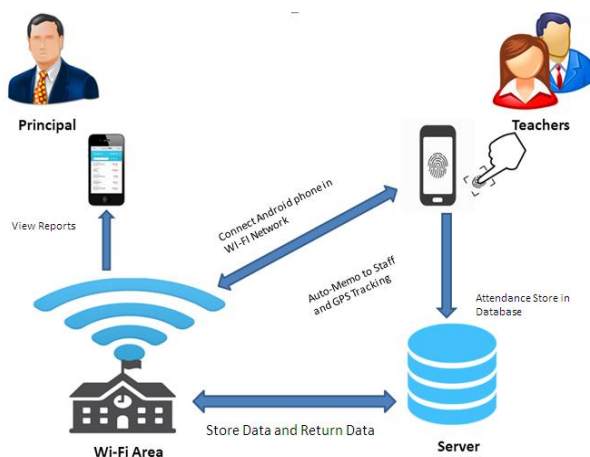
III. SYSTEM ARCHITECTURE

Fig 1. Proposed System

Description:
In the above architecture when employee (staff) connect in WI-FI network that time he/she can mark their attendance through android Smart Phone using their finger print . Employee can change their profile. Employee can check the memos which are generated by admin. In this simple way they can track their own attendance every time.

In the second module Admin (principal)will be able to view the attendance of staff individually as well as check staff memo.
In third module system will be able track their employee using GPS so it is easy to find any employee in the campus.

IV. TECHNOLOGIES USED

A. SIP
We first introduce an SIP-based location management framework in opportunistic Wi-Fi networks where Wi-Fi and cellular systems are integrated and Wi-Fi hotspots are sparsely deployed. We then propose an SIP-based location update procedure based on the concept of the MR scheme, which is effective in reducing the location update cost. After that, we propose a timer-based session setup procedure to diminish the session setup dormancy incurred in the previous MR scheme.
SIP is a signalling protocol used to create, modify, and terminate a multimedia session over the Internet Protocol. A session is nothing but a simple call between two endpoints. An endpoint can be a smartphone, a laptop, or any device that can receive and send multimedia content over the Internet. SIP is an application layer protocol defined by IETF (Internet Engineering Task Force) standard. It is defined in RFC 3261.

B. Grayscale-based Matching, Edge-based Matching
Grayscale-based Matching is an advanced Template Matching algorithm that extends the original idea of correlation-based template detection enhancing its efficiency and allowing to search for template occurrences regardless of orientation. Edge-based Matching enhances this method even more by limiting the computation to the object edge-areas.

C. Image Pyramid:
Image Pyramid is a series of images, each image being a result of down-sampling (scaling down, by the factor of two in this case) of the previous element.
Image pyramids can be applied to enhance the efficiency of the correlation-based template detection. The important observation is that the template depicted in the reference image usually is still discernible after significant down-sampling of the image (though, naturally, fine details are lost in the process). Therefore we can identify match candidates in the down-sampled (and therefore much faster to process) image on the highest level of our pyramid, and then repeat the search on the lower levels of the pyramid, each time considering only the template positions that scored high on the previous level. At each level of the pyramid we will need appropriately down-sampled picture of the reference template, i.e. both input image pyramid and template image pyramid should be computed.
Edge-based Matching enhances the previously discussed Grayscale-based Matching using one crucial observation - that the shape of any object is defined mainly by the shape

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of its edges. Therefore, instead of matching of the whole template, we could extract its edges and match only the nearby pixels, thus avoiding some unnecessary computations. In common applications the achieved speed-up is usually significant. Matching object edges instead of an object as a whole requires slight modification of the original pyramid matching method: imagine we are matching an object of uniform color positioned over uniform background.

All of object edge pixels would have the same intensity and the original algorithm would match the object anywhere wherever there is large enough blob of the appropriate color, and this is clearly not what we want to achieve. To resolve this problem, in Edge-based Matching it is the gradient direction (represented as a color in HSV space for the illustrative purposes) of the edge pixels, not their intensity, that is matched.

V. CONCLUSION

This system will provide an android based application for attendance marking of employee's. The application offers user friendly, reliability, time savings and easy control. It helps to identify the employees and provides way to make entry of their presence in college. Records of attendance will be safe and updated. All attendance records can be easily accessed by principal but securely by unauthorized user just because of bio-metric authentication process.

FUTURE SCOPE

The system can be improved by adding the features that indicate if the teacher is late. The system can be enhanced to track the arrival and exit time of the teachers for additional monitoring. The system also can be improved by tracking the teacher's locations. So that, monitoring the current lecture and punctuality of teachers will be easy to record.

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