International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 10 Special Issue: | Apr 2023 www.irjet.net p-ISSN: 2395-0072

International Conference on Recent Trends in Engineering & Technology- 2023 (ICRTET-3)
Organised by: VSM College of Engineering, Ramachandrapuram

Efficient Attendance Management in the Classroom throughCitizen Sensing Technology

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ABSTRACT:

In smart cities, intelligent learning environment is an important application scenario, and class attendance checking is an important measure to urge students to attend on time and ensure the quality of learning. Aiming at the existing problemsin class attendance checking, such as low efficiency and easy to cheat, a student attendance management method named AMMoC (Attendance Management Method based on Crowd-sensing). AMMoC includes two phases, i.e., the initialization phase and the authentication phase. In the initialization phase, a teacher sends an attendance checking request to the server. After receiving the request, the server sends a request to tell students to submit their location information, and then forms the student location map once the server receives all the response from students. In the authentication phase, the server verifies the truth of the location information by sending requests to several students to count the number of students. Experiment comparisons and analyses show that AMMoC has the advantages of good anti-cheating performance, fast speed, and little disturbance to class, and is suitable for attendance checking applications in classroom environment.

KEYWORDS: AMMoC, Crowd-Sensing.

1. INTRODUCTION

Mobile learning is increasingly becoming an indispensable learning paradigm in modern education systems. Applying the mobile computing technology to the classroom environment can solve many problems in traditional class learning systems, e.g., laborious class management, non-timely feedback in teaching effect, and poor communication between teachers and students. Nowadays, mobile education has become one of the hotspots in the modern education field.

We propose an intelligent attendance management method named AMMOC. AMMOC need neither deploy additional hardware devices in the classroom, nor collect the biological characteristics of students. AMMOC only needs to install two Android applications on mobile devices of teachers and students respectively, and uses mutual verification between students to complete attendance checking. AMMOC divides the classroom into several sub regions, and assigns students to verify the student number of sub regions.The verification process is classified into a series of crowd sensing tasks . At the beginning of attendance checking, students submit their location information to AMMOC within a time limit. After AMMOC obtains the location information of students, it uses an algorithm based on intelligent search, selects several students to complete the crowd sensing tasks which require to submit the number of students of a specific sub region, etc. AMMOC will analyze the truth of the initial location information based on the results of the crowd sensing tasks submitted by the students.

2. EXISTING SYSTEM

The ID-based attendance checking system usually uses RFID and NFC (Near Field Communication) technology. Rjeib Et Al. proposed a RFID-based attendance management and information service system named AMS. In AMS, each student's identity information and class schedule are bounded to the RFID tag of the student ID card. All attendance records and student information are stored in the database and displayed on a web application.

Ahmad et al. designed an NFC-based attendance checking system named TouchIn. TouchIn includes two main units, the reader unit and the web server unit. Students can use mobile devices or student ID cards with NFC tags to touch the NFC reader to complete the attendance checking.

Jacob et al. integrated the one-time password (OTP) technology into the ID-based attendance checking system. Once the NFC reader detects that a student has entered the classroom, the server will randomly generate a unique one-time password for each student, and send it to the student's mobile device. After receiving the information, the student needs to submitthe password through the pre-installed application on the mobile device to complete the attendance checking.

Disadvantages:

- The system is not implemented by AMMoC.
- The system doesn't implement sub region selection method.

3. PROPOSED SYSTEM

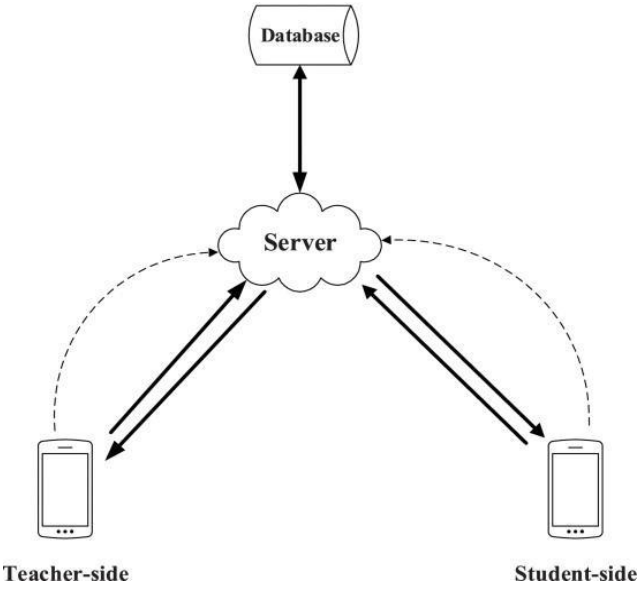
In this, we are using an intelligence attendance management method named AMMoC. AMMoC need neither deploy additional hardware devices in the classroom, nor collect the biological characteristics of students. AMMoC only needs to install two Android applications on mobile devices of teachers and students respectively, and uses mutual verification between students to completeattendance checking.

AMMoC divides the classroom into several sub- regions, and assigns students to verify the student number of sub-regions. The verification process is classified into a series of crowdsensing tasks. At the beginning of attendance checking, students submit their location information to AMMoC within a time limit.

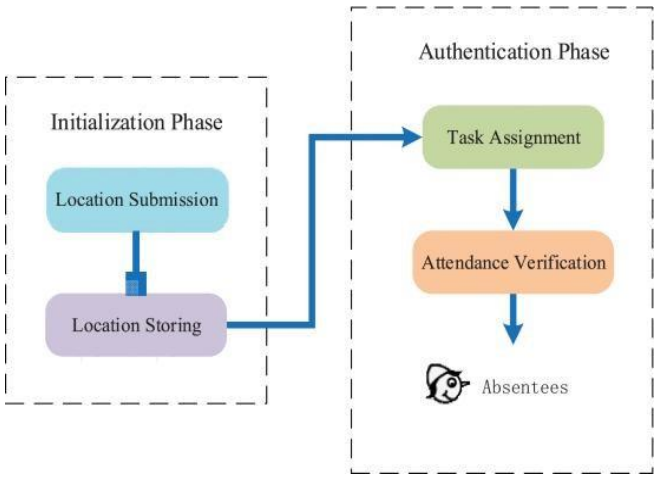
Advantages

- This paper presents a student attendance management method that combines the active reporting and sampling check of students' location information, which has the advantages of high real-time performance and lowdisturbance.
- This paper proposes a method which evaluates the value of sub-regions based on the remainingnumber of students, which can accurately select the optimized sub-regions for attendance verification.
- This paper proposes a sub region generation method based on certain randomness, which can fully explore the possible sub-regions space, and improve the anti-cheating performance of the attendance checking.

4. SYSTEM ARCHITECTURE:



AMMoc Architecture:



5. MODULES IMPLEMENTATION

Service Provider

In this module, the Service Provider has to login by using valid user name and password. After login successful he can do some operations such as Browse and Train & Test Data Sets,View Trained and Tested Accuracy in Bar Chart,View Trained and Tested Accuracy Results,View Prediction Of Attendance Type,View Attendance Type Ratio,Download Trained Data Sets,View Attendance Type Ratio Results,View All Remote Users.

View and Authorize Users

In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.

Remote User

In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored to the database. After registration successful,he has to login by using authorized user name and password. Once Login is successful user will do some operations like predict student attendance type, view your profile.

Data Owner Module

First, AMMoC stores the coordinate of each student in the matrix M according to its ID. Each mobile device will be bound to a student ID, so AMMoC can obtain the corresponding student ID according to the mobile device information (such as the IMEI code). When the submitted coordinates conflict, that is to say, more than one student submits the same coordinate, AMMoC will require these students to submit their coordinates again. However, each student has only one chance to correct their coordinates because students may have made an incorrect input by accident, and this measure also, can prevent fake attendance caused by submitting coordinates for multiple times. After data storing, AMMoC generates a matrix M that contains all students' location information in theclassroom.

The matrix M will be used as the input of the MCTS algorithm. In addition, AMMoC will draw the student's seat map according to the matrix M and return it to the teacher-side to show the state of student attendance.

Data User Module

The extracted confidential information includes the user's name, location, and IP address. In this case, the private information can be traced to identify the legitimate data owner, causing a breach of privacy. Even though public-key infrastructure (PKI) can provide WHCS with data security benefits, it is not without security issues.

6. CONCLUSION

This plan shift the attendance checking scene into the virtual one in order to extend the on-site classroom attendance checking to the attendance checking in the online learning environment. It also achieve continuous non-disturbance attendance checking in order to be suitable for the applications of multiple learning scenarios. The experiment results show that the AMMOC has the advantages of short attendance checking time and high accuracy. Therefore, it is suitable for AMMOC to perform attendance checking in a classroom environment.

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