

A Student Attendance Management Method Based on Crowdsensing Environment

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Abstract: This project proposes a student attendance management method named AMMoC (Attendance Management Method based on Crowdsensing). 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. The authentication phase includes two modules, i.e., the task assignment module and the attendance verification module. In the task assignment module, AMMoC first finds the optimized sequence of subregions and verifiers by using the Monte Carlo algorithm, and then requires the verifiers to count the number of students in the subregion. Finally, the statistics results will be verified in the attendance verification module. 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: Classroom environment intelligent learning environment, Crowd sensing, authorisation, verification, location map, attendance checking request, mobile learning, Mont Carlo tree search algorithm, statistical result

1. Introduction

With the popularity of mobile devices, building a mobile learning interactive environment has become an important problem during the construction of smart cities.

Mobile learning is increasingly becoming an indispensable learning paradigm in modern education systems. Applying the mobile computing technology to the classroom environment (i.e., mobile education) 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.

It proposes 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. The main

contributions of project are as follows. It 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 low disturbance. Also proposes a method which evaluates the value of sub regions based on the remaining number of students, which can accurately select the optimize sub regions for attendance verification, 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.

2. Problem Statement

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 modern education field.

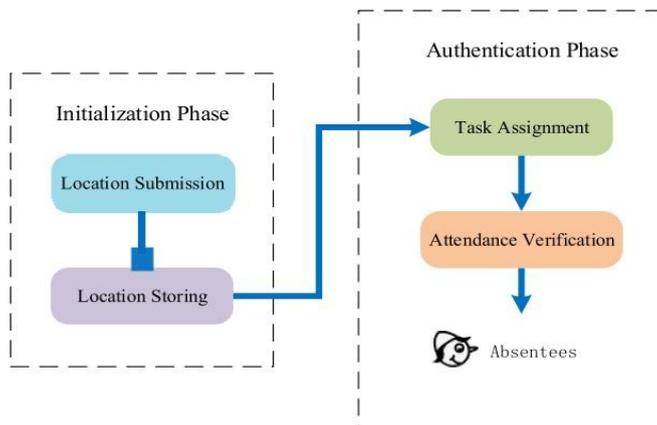
3. Proposed System

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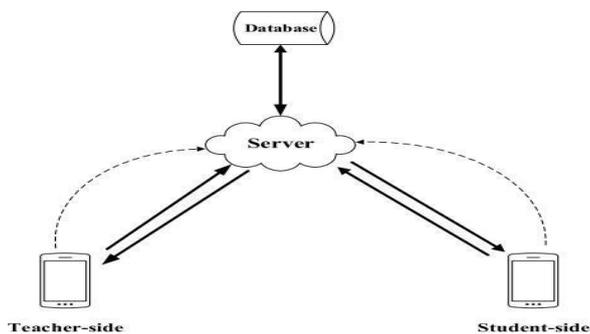
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4. Design Process

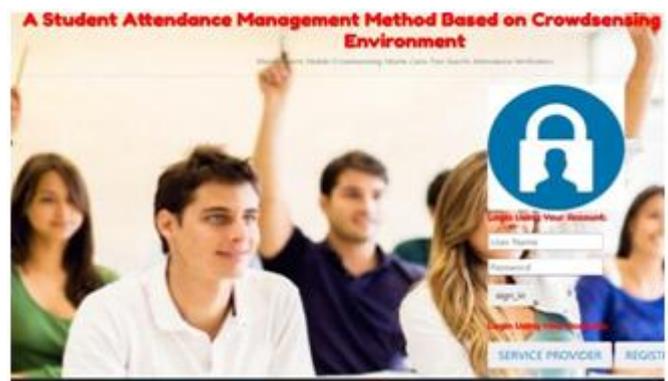


The workflow of the AMMoC is shown. It includes two phases, i.e., the initialization phase (the components in the left dashed box) and the authentication phase,



(the components in the right dashed box). The first phase is the initialization phase, which includes a location submission module and a location storing module. In the location submission module, each student needs to submit his location information to the server. The second phase is the authentication phase, which includes a task assignment module and an attendance verification module. In the authentication phase, the system will verify the truth of the location information submitted by the students in the initialization phase. In the task assignment module, AMMoC divides the entire classroom area into several subregions. In order to reduce the disturbance to class and maximize the efficiency of attendance management.

5. Research Discussion



The Service Provider has to login by using valid user name and password 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. 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 logout.

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.

References

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