

Real-time Class Attendance Android Application Using GPS Technology

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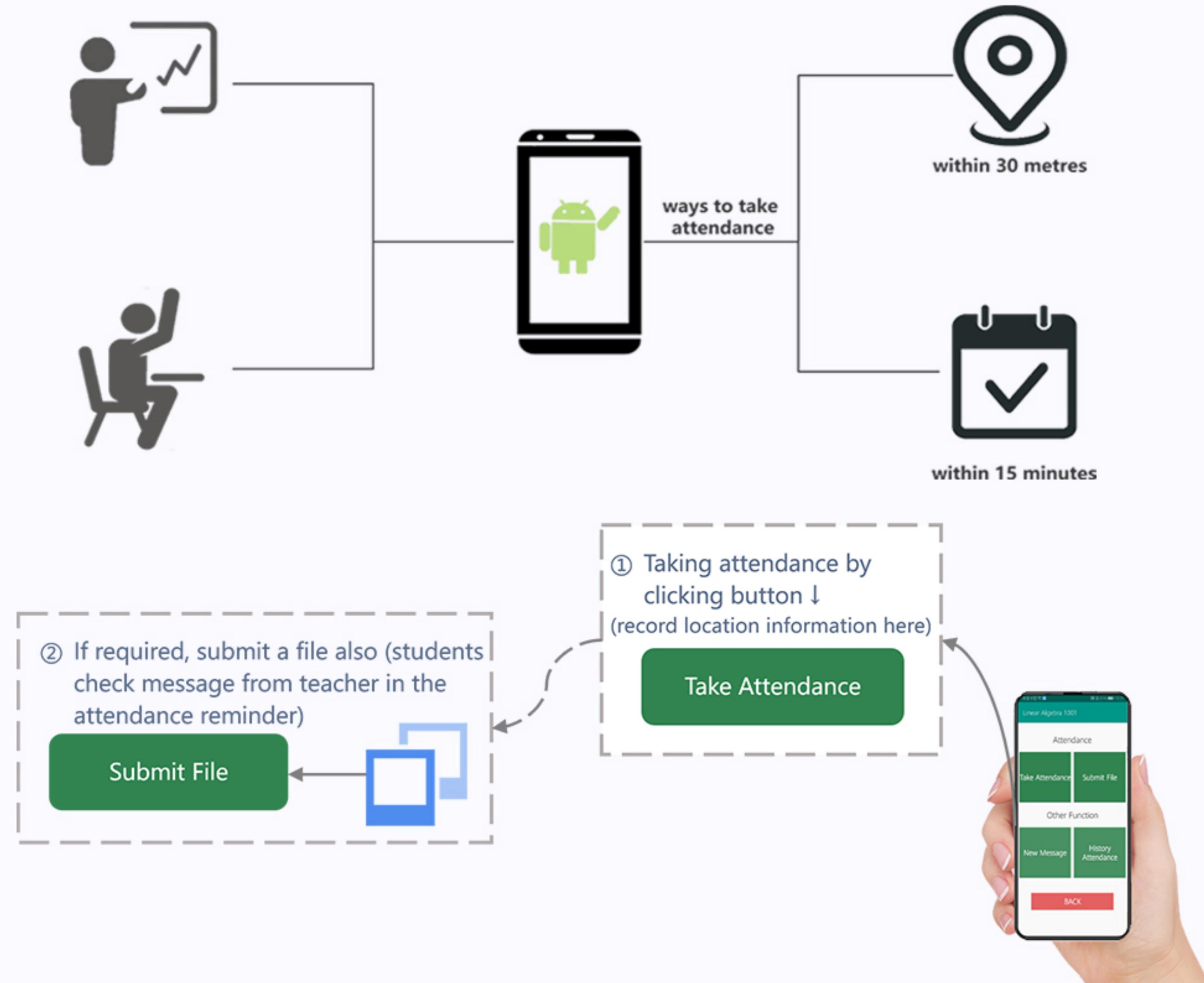
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Abstract

Class Attendance System (CAS) is an Android application designed and developed to **make attendance management of UIC teaching activities better**, and to **avoid attendance cheating**. Different from paper-based attendance in the past, this system does not require any paper to record attendance. Instead, it runs as an application on a mobile device equipped with an Android system connected to the Internet, and realizes data exchange between the application and an **Aliyun online database** through network transmissions. Students, teachers and the system administrator use the same system for the attendance. Students automatically **submit their own GPS location** when taking the attendance; they may also be required by the teacher to submit a picture of the specified content; all recorded data is stored in the online database. In addition to operating the attendance of courses he teaches, the teacher can remind students to take attendance in time by means of a message. All attendances are required to be **completed within 15 minutes**; the distance between students and teachers should also be **within 30 meters** when the student signs in. Teachers can view the status of students' attendance in the built-in **Gaode map of the system**, **check the location** of attendance or **submitted pictures** anytime and anywhere. The administrator manages the attendance of all courses and his rights of appointing and dismissing teachers, as well as changes his account information. The system visually displays data through maps, pictures and tables, improves the **efficiency and accuracy** of attendance management, and helps teachers maintain the **cost-effective class**.

Introduction

Class Attendance System not only reduces the burden on the classroom teacher, but also allows for recording and documentation of student attendance. It also prevents students from cheating during the sign-in process, as the program can record students' **location information** (distance between teacher and student should be within 30 metres) and students are asked to **upload pictures** (within 15 mintures of the setting time) if required.



Methodology & Design

Research Methodology

- Demand and analysis
 - discussed the development objectives and feasibility
 - decided the prevent cheating method used in Class Attendance System
- Fixed the frame work of project
- Design the detail^[1]
 - programming and test if the function satisfied target
 - improvement



Tools & Equipment

Hardware: HUAWEI Mobile Phone

Software: Android Studio 3.6 || Gaode Map API || Aliyun RDS Database

Resource Structure

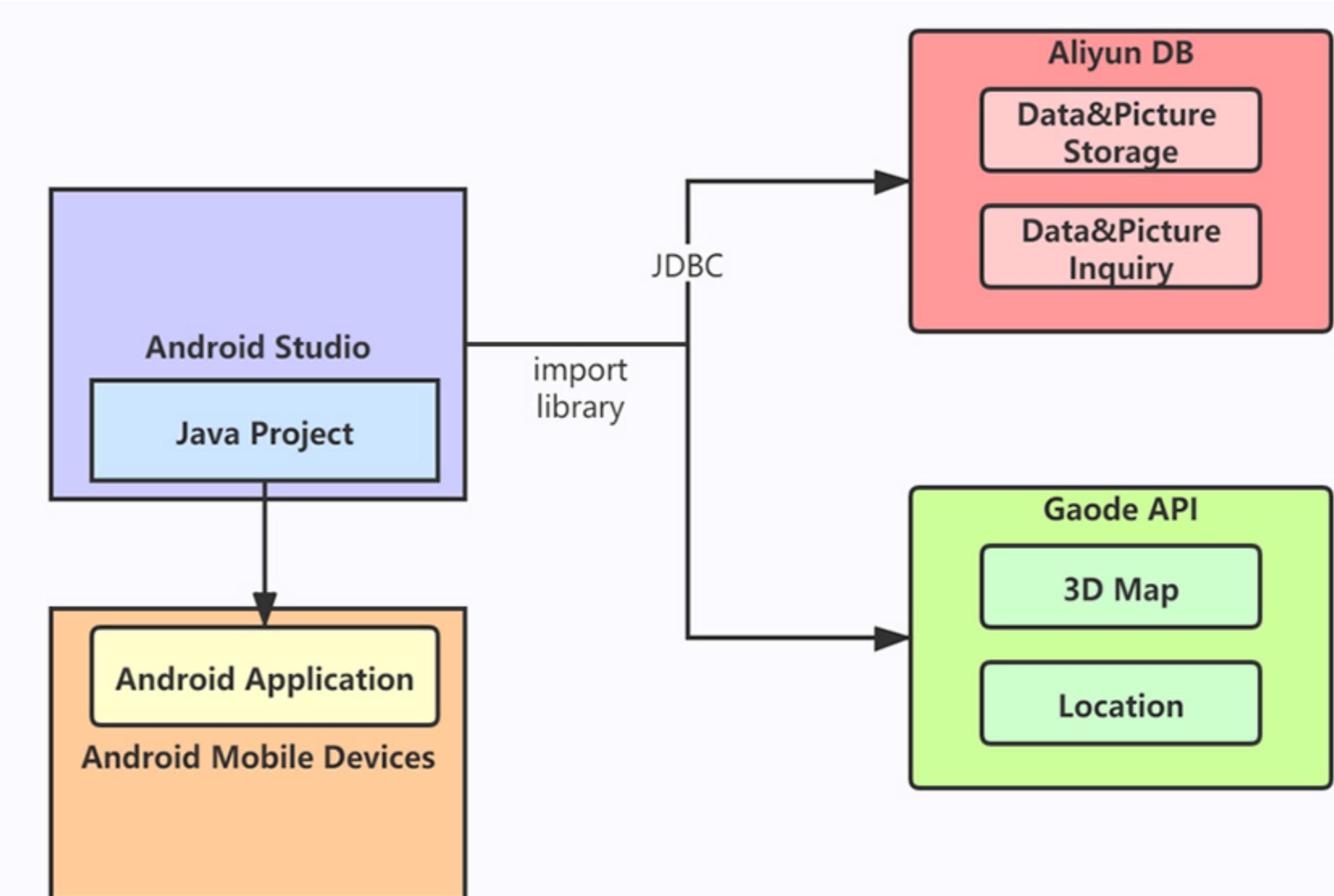
Early literature research focused on the connection of online database and the use of location tracking technology^[2].

Data flows between client (application) and server (aliyun ECS^[3]) in the system.



Our project is loaded into Android Mobile Devices as an Android Application.

- Java project is built base on example provided by **Android Studio**
 - use **JDBC** to connect the Aliyun Database with Android Studio
- Aliyun RDS Database** to manage data and pictures
- Map API** provided by Gaode to show 3D maps and location.



Implementation

As an Android application, users (include teachers, admin teachers, students and the system administrator) only need to download and install the installation package of CAS application on the Android mobile device to use the system.

The screenshots demonstrate the following features:

- login page**: Shows fields for Username and Password, and options for Student, Teacher, or Administrator.
- admin management**: Shows a list of Admin, Teacher, and Course. Subscreens for Set, Delete, and Update are shown for each category.
- teacher management**: Shows a list of Remind Student and Student List.
- student management**: Shows a list of New Message and History Attendance.
- (example of fill in page) update attendance**: Shows a form for Update an Attendance with fields for Time (16:35:00), Date (2020-12-03), and Remind student in (HH:MM:SS). It includes checkboxes for One-Touch Sign In and One-Touch Sign In + Submit File.
- check attendance by map & pictures**: Shows a map of a university campus with student locations marked. It also shows a submitted photo of a dog.
- check map through students' attendance list**: Shows a list of student attendance with SID, Name, Times, and Check status.
- submit file**: Shows a screen for Submit A Picture with a SELECT button and a preview image of a dog.
- course list**: Shows a list of courses including LINEAR ALGEBRA 1002, SOFTWARE ENGINEERING 1001, SOFTWARE ENGINEERING 1002, and COMPILER CONSTRUCTION 1001.

Conclusion

Class Attendance System application helps teachers **manage class attendance** in mobile phone and aims to **avoid cheating on class attendance**. The system does not sign students' name as the evidence of presence as before, but record their **location** and **submission of pictures** for teachers to check attendance.

Taking attendance by CAS application ensures the sign-in activity is **effective**, and **saves lots of time** for the sign-in activity: the original way of attendance is that a piece of attendance paper is continuously passed in the classroom, which is also a waste of time^[4]. The system give an **intuitive feedback** to teachers, to grasp the students' class **status**.

Reference

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