GPS Application for Bus Position Checking
TD3-12
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Overview
In Hong Kong, the bus is a popular public transportation method for people. In many cases, people were waiting a long time for buses and it is clear that a system which provides real-time information is needed. In Hong Kong, the summers are very hot and waiting in the sun or heavy rain is very uncomfortable for commuters in particular the elderly and young children. Currently, no information system exists which can give bus users information on the intervals between buses. Basically, it is a great advantage for the user to know when a bus is coming, and the existing system does not currently have this type of function. Our aim is to design a software that can track the bus location and provide the user with information about the bus stop (e.g., its location), let the user get the bus stop information. With this software, the user can get the information of the nearest bus, the user can think about when they should leave and it also gives the user the opportunity to take alternate transport if the wait is too long. This may also help the length of queues.

For this purpose, we want to focus on the bus, not the bus stop. Hence, we aim for an aplication software which can provide the location of the nearest and desired bus to the users. Also, we hope the software can provide the visual view of the location, the users can get clearer information about the coming bus.

System Block Diagram

Methodology
As users are interested in using bus information to the user and we have decided to build a system that can track the transport and send the information to the user. The user can then use this information to estimate how long they have before the next bus will be at their nearest bus stop, and make sure of their times appropriately.

For this purpose, the system should be separated into three parts. One is server part for storing the data of the bus and bus route, another one is the web part such that can receive the bus information from the server and the other one is the bus part that will send their location to the server.

We decide to use MySQL to build our database system, Android as our smart phone OS and the visual basic as our server and the simulation programme.

Data
There are three stages to our GPS bus tracking system - Hardware Implementation and Testing, Software Implementation and Testing, and Whole System Implementation and Testing.

In the hardware system implementation stage, the suitable smart phones with android platform were found and setup to the status such that can install the app. Also on a higher standard computer was setup for the software.

In the software system implementation stage, the mobile app were compiled by Android SDK. The server software were compiled by visual basic.

In the whole system implementation stage, we installed the user software to the android supported phones. Finally, we installed the server software in the standard desktop to be used at a server.

Testing
For the testing, the system was tested in four parts. First one is the server request part, second one is the part bus will send its own location to the server, the third one is the part server manage the information and the fourth one is the part that user receive the bus data.

Result
Actually, the app is supposed to provide useful information on the buses for bus users.

In the design phase, the useful information was defined (briefly) a few times. We then finished the information types. After defining the information type, we worked on this methodology and we selected the network communication for data transfer. This method is a basic method for everyone to get data.

For the database selection, we originally chose the web-based MySQL database, but it could not be linked due to a technical problem. Hence, the database was changed to the MS SQL format and linked to the server directly.

Also, the server would receive any client information, we had to use something to determine whether the message is a signal to receive the data. Therefore, we have to think about how the signal header like. Based on the different header, the server will perform different action like updating database and send out bus information.

Base on the above design and adjustment, this server part basically fulfills the requirements of the system.

On the client part, the programming problem behind the app is not difficult to achieve, the difficult part of the programming in the app is to create the route of the bus stops.

We have not provided the route for users, the reasons is we need a list of latitude of the bus route, the program provide point to point straight line connection, if we want to provide a smooth path, we need get at least hundred point of each bus route.

Finally, we have achieved the purpose we set out to do - we can provide the bus location for users which will make their travel more efficient. When users get the bus location, they can choose the best option such as to continue waiting for the bus or change to other transportation...

Actually, this app is a helper? That force us to thinking how to improve our life. A new technology, new theories are important for the world but if we do not combine and integrate different technology based on some theories to create new things, theories is theory only.

For the further development, we are attempt to contact the bowloon-meter bus company to get support. It is because the bus information is very essential to us. Also, this project could be designed as a platform to let the user share the bus information.

The software can collect all the users’ location by app and determine where this bus is, and the direction also.