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Location Tracking System using GPS

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Abstract : ***for most city travelers, the arrival time of busses is the key detail. Excessively long waiting times at bus stops also deter and make relevant travelers from taking buses. In this paper, a method of bus arrival time prediction is presented based on participatory passenger sensing.With commodity cell phones,t he local environmental history of bus passengers is effectively gathered and used to predict bus travel routes and forecast bus arrival times at different bus stops. The proposed program relies entirely on the participating users 'joint efforts and is independent of the bus operating companies, In this way, universal bus service support can be effectively introduced without the need for funding from different bus operating companies. The resort to more commonly accessible and energy-e fficient sensing devices, including cell tower signals, movement st atuses, audio recordings, etc., instead of referring to location information permitted by GPS,Which puts less pressure on the in volved party and encourages its involvement.***

A prototype system is designed with various types of Android based cell phones and an extensive trial duration of 7 weeks with the NTU campus shuttle buses as well as Singapore city buses. The test results indicate that the program proposed achieves excellent predictive accuracy compared to the solutions implemented by certain bus operators and supported by GPS. Further implementing the system and conducting 4-day rapid trials with London bus system, indicating quick implementation o f the proposed system and promising city-wide results. At the same time, the proposed solution is available in more general terms and is energy efficient.

Keywords **: *Bus detection, GPS, Location tracking, Sensor.***

I. INTRODUCTION

The arrival time of the bus is the key detail for most people who travel by bus. Travelers are irritated by the long waiting time at the bus stops and they avoid taking buses. We will present a bus arrival time-prediction method in this project. A GPS (Global Positioning System) would monitor the location of the bus and feed the server with the updated information. This is achieved with the help of Location Based Services. Through sending an SMS, the user will be able to get the bus location information from the mobile phone.

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A microcontroller must process the information and turn on the GSM (Global Mobile Communication System) to give the user a message. Bus is the most extensive and accessible mode of transport for college going students, a company's workers or for a common man. Bus use for transportation decreases the use of private vehicles and therefore lowers the fuel consumption. It will also relieve congestion in traffic. The customer usually wants to know the bus's exact time of arrival. Waiting long at bus stops discourages the use of buses. There are also many unpredictable factors that interrupt a bus schedule such as harsh weather conditions, traffic conditions etc. To this end, we are proposing a project that will help the bus travelers predict bus timings. The device mentioned uses a server and GSM modem, GPS and Microcontroller. In this paper we suggest a revolutionary approach to predict details about the bus. To this end no special device is needed. In Android Mobile the SMS Server is created. The method uses a cautious combination of GSM modem and GPS for be achieved by satisfactory results.

A. Global Positioning System

The Global Positioning System (GPS) is a Navigation System based on satellites. It is used for synchronization of the clock and for indication of location. The GPS measures the bus location by measuring variations in the times the sig nals are taking to reach the receiver. The GPS transmits the received signals via PIC to the GSM module.

B. Mobile Phone Base Participatory Sensing

Participatory sensing systems (PSS) require frequent injectionof material that is short in shelf life. Hence the useo f crowds to gather information about PSS is particularly challenging. Participatory sensing is the idea of societies (or other groups of individuals) that contribute sensory information to shape a knowledge body. Mobile phones which have multiple sensors have made large-scale participatory sensing variable. Participatory sensing can be used to collect environmental information, temperature, congestion. It was essentially ineffective and statistically similar to the state of control where there was no request for participation when a individual was actually invited to participate but was still able to access community-generated data if they rejected an application. Therefore crowd source system designers should consider implementing PSS-type quid-pro-quo policies that focus on less users but make them more efficient. Participatory sensing systems (PSS) include the commercial Waze service, a smartphone app that motivates bus drivers to help others track traffic conditions.

II. EXIXTING SYSTEM

When travelling with buses, the traveler usually want to know the accurate arrival time of the bus.

Excessively long waiting time at bus stops may drive away the anxious travelers and make them reluctant to take buses. Nowadays, most bus operating companies have been providing their timetables on the web freely available for the travelers. Nevertheless, bus timetables only provide limited information (e.g. operating hours, time intervals, etc.) that are not usually updated in a timely manner. Other than those official timetables, passengers are provided with many public services (e.g., Google Maps).while these services provide valuable details, it is far from satisfactory for the bus travellers.

A. Disadvantages of Existing System

1) The schedule of a bus may be delayed due to many unpredictable factors (e.g., traffic conditions, harsh weather situation, etc.) 2) However, usually requires the cooperation of the bus operating companies (e.g., installing special location tracking devices on the buses), and incurs substantial cost.

III. PROPOSED SYSTEM

In this paper, we present a novel time prediction bus arrival system based on crowd-participatory sensing. We asked bus passengers about getting the arrival time for the bus. Many passengers report having to monitor the arrival time of the next buses immediately and are willing to contribute their location information on buses to help set up a system to predict the arrival time for the city at different bus stops. This motivates us to build a crowd-participating service that connects those who want to learn bus arrival time (inquiring users) to those who are on the bus and are able to share information about the instant bus route (sharing users).To accomplish such a goal, we let the bus passengers themselves use commodity mobile phones to cooperatively sense the details about the bus route. In particular, passengers who share can upload their sensing data collected on busesanony mously to a database server which intelligently processes th e data and distributes useful information to those users.

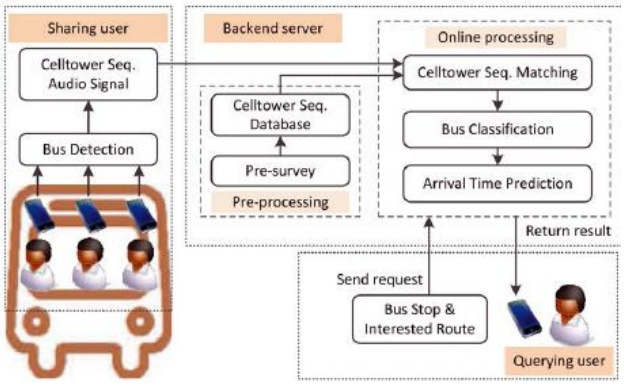

Fig 1 System Architecture

IV. PREPROCESSING DATA

The backend server will maintain a database which will store sequences of cell tower IDs located along various bus routes. The mobile phone usually absorbs multiple cell tower signals at a time while traveling along one bus route, and links with the highest signal strength to the cell tower. To increase the Robustness of our method, we record a series of cell tower

A. Collecting And Storing The Data In Server

We match the obtained cell tower sequences that are stored in the database to those signature sequences. When the sharing user enters position B, The backend server receives a sequence of 7, 8, 4 and 5 cell-towers. Say the cell tower sequence of the bus route that is stored in the database is 1,2 ,4,7,8,4,5,9,6, and then the sequence 7, 8, 4, 5 corresponds t o the specific bus route as a sub-segment.The server should save the data, and should provide the server if the user queried for the data.

B. Bus Detection Classification

The mobile phone can intelligently determine if it is on a public transportation bus and only collect the data when the mobile phone is on a bus. Audio Detection, In our system, we chose to allow the mobile phone to detect the beep audio response of the card reader as these distinct beeps are not widely used in other transport modes, such as non-public buses and taxis.

1. **Acceleration Detection:**
   The buses, on the contrary, usually move with many sharp turns and regular acceleration and deceleration. We plan to use the mobile phone's accelerometer sensor to could such a false detection.
2. **Bus Classification:**
   When a sharing user gets on the bus, a list of cell tower IDs are collected by the mobile phone and the information is registered backend server. The backend server aggregates large mobile phone inputs and classifies inputs into different bus routes.
3. **Arrival Time Prediction:**
   The backend server looks up the current bus route status after receiving the request from querying use rand calculates the time of arrival at the specif ic bus stop. The server must estimate the time it wil l take for the bus to travel from its current position t othe bus stop being queried.Suppose the user sharin gon the bus is beyond the range of cell towers. The backend server determines the time of arrival at the bus stop, based on both the historical data and the present bus route status.

V. SYSTEM IMPLEMENTATION

Participatory Sensing Systems (PSS) require frequent injection of short shelf-life material. So the use of crowds to collect PSS information is particularly challenging. In this report, we're investigating the effect of two policies on user contributions. Aquid-proquo policy shares user inputs to access sensitive information within the program. A request policy clearly reminds the consumer of the need for details to make the program work perfectly. Previous work has shown that a call for assistance in a crowdsourced program is an important tool for growing contributions. During a large-scale longitudinal study inside a publicly operated, crowd sourced, transit information system, examined metric correlated with input frequency and dedication over a 10-month period of long-term use.

Our findings indicated That quid-pro-quo resulted in mor e data, but at a cost of quicker departure from the analysis. If a individual was directly requested to participate but was still able to access community-generat ed data if they rejected an application, it was essentially uns uccessful and was statistically similar to
the state of control where no request for participation was made.Crowdsource system designers should therefore consider implementing quid-pro-quo type PSS policies which focus on fewer users but make them more competitive. One of the main enablers of public operations is public transport. The bulk of the town population relies on multiple forms of public transport for their everyday commuting. To quote Bogota's City Mayor Gustavo Petro, "A developed country isn't a place where the poor have vehi cles. It's where the wealthy use of public transport" provides a strong indication that developers see the need to invest money and time constructing effective transport networks. For this purpose, transportation operators and planners look to both hardware and software for the technology and infrast ructure.

This is not only about making their programs effective but also about improving the experience of the people. It is agreeable that in most mega-cities the transport networks are very well developed. However, by means of mobile devices or display boards at stations, most public transit companies are now making the timetables or schedules of their services available to internet switchers. Yet, it's also a case that the dynamics of the city are changing over the day and there ar e unexpected delays. Long waiting times tend to cause bad experiences for commuters as they are either unaware of where the vehicles are currently, or there are not very accurate methods that use locations reported from existing hardware such as GPS devices, mobile networks , etc. to predict the estimated arrival or travel time.Advances in GPS technology allow for position reporting with a high degree of accuracy, and this can be used to predict the time of arriv al. Various operators are already using technology such as G PS devices to track and monitor their fleet in cities such as Singapore , London and so on. It lets devices collect information about the location of vehicles in near real time i f they are collected at higher levels.It tilts the spotlight to be able to process and evaluate all of it data on fly. "Real-time Data Stream Mining" is called the model of knowledge extraction from continuous, rapid,high volume, highly var iable data streams.In this paper we address high-velocity da ta stream mining which can be applied to data produced f rom location tracking devices suchas GPS within the co ntext of urban transport. Based on location data, which is processed by an event stream processing engine, the system presented in this paper may perform real-time pre diction of vehicle arrival time. The device is tested using a built- simulator that uses re al bus routes in Singapore to model vehicle and stream mov ement at high sampling levels in the location information of those vehicles. A novel technique for estimating arrival time or travel time of vehicles in an online format is discussed in this article.The system is designed to manage several GPS data streams and predict the time for each vehicle to arrive continuously.

Fig 2 Admin Pages

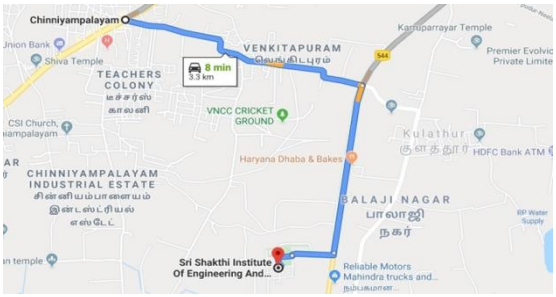

Fig 3 Tracked Location

VI. RESULT

This project has main application in college bus.It can also be used for kids tracking, or we can say human tracking. As mentioned above, it mainly targets to child safety.It will save lots of money. By using the bus routing and traffic analysis more efficient route can be found.This project offers navigation, time, attendance, and real-time school bus tracking.By using this, you can stay stress free and your children are also safe.Fig.2 After successful login of admin , he can make many operations. Admin can add student , staff and driver in database for their login purpose. Admin can view the list of students and staffs.Fig.3 After successful login ,user can view the listed buses and can view the location of specified bus

VII. CONCLUSION

This paper illustrated problems relating to participatory sensing. Secondly, to handle distributed cell phone-based participatory sensing systems, we implement a management structure based on the publishing and subscription mechanism, which aims to be related to the existing participatory sensing databases. We present a crowd-participated bus arrival time forecast method in this paper. The proposed system relies primarily on inexpensive and widely available cellular signals and offers cost-effective solutions to the problem. We test the framework comprehensively via an Android prototype program. The prediction accuracy could be strengthened in the future by also reviewing historical data on the trajectory.

As an extension, the framework would be designed generically so that spatial data streams can be managed from multiple different sources. Participatory sensing means that a community of people uses their mobile phones to monitor conditions, establishing a sensor network for people and phones. Future research investigates how more travelers can be invited to bootstrap the system, because the number of participating passengers affects the predictive accuracy of our program. The particular problem of crowed-sourced solutions is determined in large part by the rate of penetration and popularity of the service. To achieve a significant adoption rate, the service should be aggressively marketed to ensure that at least one sharing user is on the bus ready to share the bus status. During the initial phase some specific passengers (such as bus drivers) are enabled to permit customers on the mobile phone.

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