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Predicting Bus Arrival Time with Mobile Phone Based Participatory Sensing

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ABSTRACT: Now a days in many cities important thing is transport, the bus arrival time. Excessively among the travelers are fade up due to long time waiting for bud on bus stop and travelling by buses making them hesitant. To predict the exact bus time we are going to present system which is based on bus passengers participatory sensing with the interchangeable object of mobile phone for getting route of bus and it's exact arrival timing as well as prediction of arrival time of bus at different bus stops the passengers of bus are effectively collected and also utilized context of surrounding environmental. The system define on the base of users involving relies and collaborate efforts of passengers and it is not dependent from the operating companies of bus, so without support requesting from particular bus operating companies for supporting the universal bus service systems it can be adopted easily. From the more generally available resources, including signals of cell tower, Movement status, recordings of audio, etc., gather for energy efficient sensing instead of referring to GPS enabled information of location, to the participatory party and bring less burden by encouraging their participation.

KEYWORDS:Bus arrival time prediction, Participatory sensing, Mobilephones.

I. INTRODUCTION

In many parts of the world there has been well developed the public transport, especially the bus transport. Bus transport services there reduce the uses of the private car and help for save fuel and reduce congestion of traffic. Their happened millions of numbers rides everyday with around 5 million resident by the bus. The travelers usually want to know the accurate arrival time of the bus when traveling with buses. Excessively there may avoid travelling by bus due to log time waiting at bus stop and taking bus may getting hesitated. Nowadays, timetables of the have provided by the so many bus operating companies available on web which we can access freely but their information not update timely limited information update in bus timetable. Many web servers (e.g., Google Maps) are provided for travelers other than those official timetables. For the bus travelers they are far from satisfactory although some services provided all th updated information. For example, due to many factors which are unpredictable, there may be delays the bus schedule. To take alternative choices for transport instead the next bus accurate arrival time will allow travelers, and thus their anxiety mitigate and their experience is improve. Towards this aim, the real time bus arrival time offer there to the public by many commercial providers of bus information. However, there requires the cooperation of the operating companies of bus and substantial cost incurs for such services providing.

In this paper, based on sensing of crowd-participatory we present a novel system which predict the bus arrival time. For acquiring the bus arrival time we interviewed bus passengers. Most passengers want to instantly track the next buses arrival time that indicate by them and to help to establish a system for the estimation of the various bus stops arrival time for the community they are willing to contribute their information of location on buses. To bridge those who want to know the arrival time of bus to those who are on the bus and able to share their instant information of bus route to design a crowd-participated service this motivates us. For achieving such a goal, with the help of object of mobile phones we inform the passengers of bus since the information of bus route to processing server which is process data integetlly.Passengers can upload data of bus route and bus arrival time by using phone sensing theses collected data distributes information which is useful to those querying users.

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II. LITERATURE SURVEY

There provide free bus timetables on the web by the bus companies. However, only provide very limited information, by such bus timetables and according to instant traffic conditions which are typically not timely updated. Although there offer the real time bus timing by many commercial bus information providers but this service is so costly .The installation of GPS system in lot of buses is very costly it will incurs tens of millions of dollars. There raises the deployment cost even higher by the network infrastructure to deliver the transit service, which would eventually translate to increased expenditure of passengers. For those reasons, to acquire transit information current research works [12] explore new approaches independent of bus companies. To regularly and accurately track the bus information like bus timing, route, physically location of bus is the common rational of this approaches, for localization which typically uses GPS. Although there are available many GPS-enabled mobile phones on the market, without GPS modules a good number of mobile phones are still shipped. If not using GPS system and other localization scheme these issue create other approaches. Besides, there consumes substantial amount of energy by GPS module, the lifetime of power-constrained mobile phones reducing significantly. Many mobile phone users usually turn.

Figure 1: Absolute localization is unnecessary forarrival time prediction

Off GPS modules to save battery power due to the high power consumption. When GPS satellite placed without line if sight they are perform poor in mobile phone [9].

To fill this gap, by cellular signals utilizing we propose to implement a bus arrival time prediction system which is a crowd-participated. The system bridges the gap between the querying users who want to know the arrival time of bus to the sharing users willing to offer them real time bus information independent of any bus companies. Unifying the participatory users, for realizing the passenger's common welfare is our aim of design. No any location service explicit to encourage the participant, so for localization as to save the requirement of special support of hardware. There is negligible the energy has been collected from cell tower in mobile phones with the comparison of high energy consumption of GPS modules. Without reducing battery lifetime on sharing passengers' mobile phones our system therefore the cell tower signals utilizes. For accurate localization of bus the need obviate by our design. As a matter of fact, the knowledge of the current position on the route (1D knowledge) since the public transport buses travel on certain bus routes (1D routes on 2D space), and to provide the information of exact arrival time of bus with physical location. As shown in Figure 1, for instance, say the bus is currently at bus stop 1, and its arrival time want to know to a querying user at bus stop 6. Their required distance between stop 1 and stop 6 with the accurate arrival timing of bus, the exact physical location of bus.Normally the physical location of bus and 2D bus route map not necessary. In our system, we logically map the bus routes instead of pursuing the accurate 2D physical locations to a space featured by sequences of nearby cellular towers. We classify and track the bus statuses in such a logical space so as to predict the bus arrival time on the real routes.

To enable automatic and intelligent data collection and transmission we leverage various lightweight sensors on mobile phones. Although we can make use of a basket of instantly available sensor resources, on energy-friendly and

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widely available sensing signals we mainly focus. The purpose is to attract more participants to make the solution lightweight and pervasively available.

III. PROPOSED SYSTEM

The architecture of our system is shown in Figure 2. There are 3 major components.

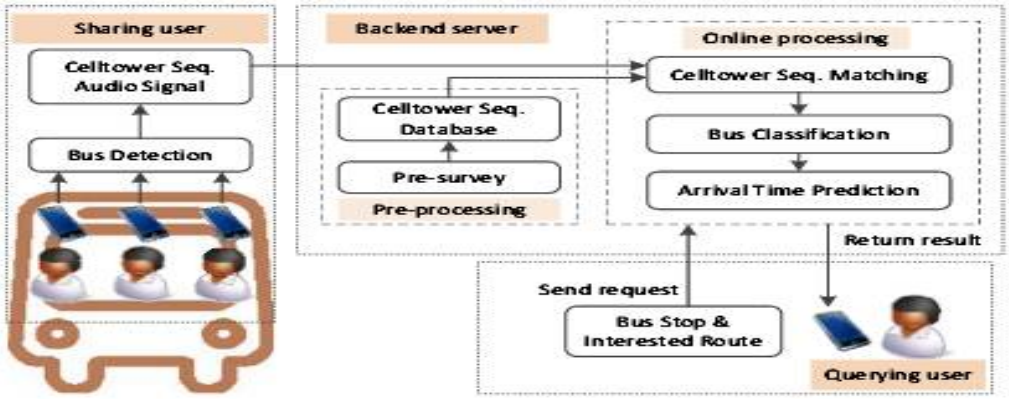

Figure 2. System Architecture

A. Querying user:

It is shown in Figure 2 (right bottom), by sending the request to the backend server a querying user queries the bus arrival time. The interest bus route and bus stop indicates by the querying user for receiving the predicted bus arrival time.

B. Sharing user:

There contributes the information of mobile phone sensing by the sharing user to the system. The data collection module starts for collecting the sequence of nearby cell tower IDs after a sharing user gets on a bus. By using the cellular network we transmitted the data. To detect whether the current user is on a bus or not by mobile phones since with different means of transport the sharing user may travel. As shown in Figure 2 (left side), the surrounding environment samples there periodically and extracts transit buses identifiable features by the mobile phone. When the mobile phones confirms on the bus. It start sampling the belltower sequence and send sequence to backend server. Ideally, there automatically performs the data by using the mobile phone sharing user with collection and transmission without the manual input from the sharing user.

C. Backend server

To the backend server we shift most of the computation burden where from querying users are addressed the uploaded information from sharing users is processed and the requests. There are involved two stages in this component. In order to bootstrap the system, in the offline pre-processing stage we need to survey the corresponding bus routes. We associate the database which stored information of bus route. These information collect from the cell tower. We define the bus route as per that we collect sensing data and consider them as ID to getting exact location of bus collect these IDs , which reduces the initial construction overhead significantly. In the online processing stage The cell tower sequences and audio signals are processed by the user who can traveling from bus theses work done by backend server. The backend server first distinguishes the bus route that the sharing user is currently traveling with receiving the uploaded information. With the reported cell tower sequence information the backend server classifies the uploaded bus routes primarily. Different bus stops are derived on the base of exact location of bus and bus route.

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IV. EXPERIMENTAL RESULT

We have used our system to predict the bus time and it is very useful to reduce the user waiting time of bus. In this system we have used GPS system to track the bus current location also we have used OTP system in which we have reduce the paper work also. The following figure shows the login form of the proposed method.

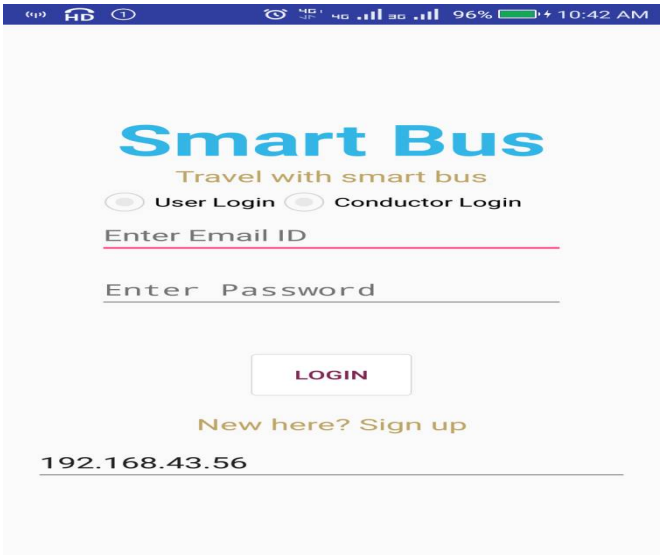

Fig. 3: Login Page

The second page is the navigator page in which user will navigate the bus current location. In our project we are using GPS to track the bus location. So that it can be show the location on the Google map.

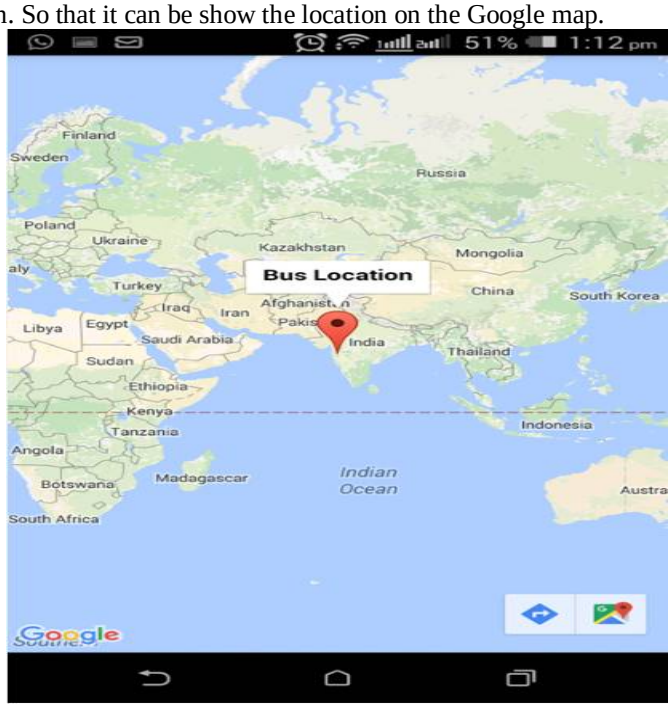

Fig. 4 Final Output Of Project

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V. CONCLUSION

In this paper, using commodity mobile phoneswe present a crowd-participated bus arrivaltime prediction system. There efficiently utilizes lightweight onboard sensors by our system whichencourages as well as attracts participatory users. There provides the cost-efficient solutions by proposed system to theproblem which primarily relying on widely and inexpensive available cellular signals. System deployed on the Android platform througha prototype withtwo types of mobile phones we comprehensively evaluate the system. A flexible framework provide by the proposed scheme provides for participatory contribution of the community being independentof any support from transit agencies and location services.

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