



REAL TIME BUS LOCATING SYSTEM (RTBLS)

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ABSTRACT

In today's world time is very important and the human race has been working on it to optimize it. Many times it happens that we are waiting for the bus and we don't know how long it will take to reach us, Maybe bus will come just next minute or maybe it will take 30 min or more. Some time's this uncertainty is intimidating and frustrating more over it wastes a lot of our precious time. If we could have a system that can tell us exactly how long it is going to take the bus to reach us, wouldn't it be wonderful?

One more problem comes forward when we go out of our cities (home places) to a new city where we don't know anything about places, about bus routes etc. , we tend to take taxis or auto to reach our destination but localities takes advantage of this and charge us a lot more than the real cost. But if we had a system in which we have to feed our source and destination and it would provide us all the buses to that route and how long each bus will take to reach us and how much it would cost us. This will promote public transport and make the person fell like home.

The paper describes a practical model for real-time tracking the bus all over the country based on the Global positioning system (GPS). The supporting device GPS continuously move with the bus and will calculate the coordinates of each position. Any bus having the GPS tracker in it and attached with the Real Time Bus Locating System (RTBLS) can be easily traced using a smart phone.

I. INTRODUCTION

The person using Real-time Bus Location system, only have to enter the bus Route number (if he/she knows it) or can simply enter the destination or can just point on the screen where they want to go. The RBLs will provide you the location of all the relevant buses to you, with respect to your current location and the time they will take to reach you with price details of each bus.

II. RELATED WORK

Bengaluru Metropolitan Transport Corporation (BMTC) has launched the similar kind of app. But it is localized i.e. it is only working in Bengaluru and our goal is to unite India. Our application is going to serve user no matter within a city or between cities. Anywhere in the India person might be he/she need not worry. Where ever a passenger wants to reach can reach easily by using cheap public transport need to pay a great amount of money to taxi or auto drivers because you are new to the place.

However, BMTC has some serious flaws:-



1. The data is not live. I.e. once you initiate a search, the status and location of buses at that instant is fetched and shown. So 10 seconds later you don't know where the bus is. Then you have to keep refreshing and on every refresh, it can take up to 30 seconds to fetch data.
2. There should be some way to select a bus stop from a map view. Sometimes you don't know the exact name of the bus stop which you are at so would be really helpful in those.
3. Not so user-friendly.

III. WORKING

As GPS system relies on time, it is very important to keep accurate time. For this purpose satellites use atomic clock to keep accurate time. General and Special Relativity speculate that the difference will come in that twin clock on Earth.

General Relativity speculates that the time appears to move slower under stronger gravitational pull – the clock on satellites seems to run faster than the twin clock on Earth.

Furthermore, Special Relativity predicts that because the satellites' clocks are moving relative to a clock on Earth, they will appear to run slower.

Triangulation:

GPS is nothing but the system of satellites in space working as reference points for our locations on the earth.

Let's understand how three satellites in space can "triangulate" our position anywhere on the earth by calculating the distance between us and them.[1,2,3]

The Big Idea Geometrically:

Step 1:

Let's assume that we calculated distance from a satellite and it turned out to be 10,000 miles.

Knowing the distance between us a satellite narrows down our possible locations in the radius of 10,000miles surface in the whole universe.

Step 2:

The next thing done is, measuring our distance from the second satellite and it turns out to be 11,000miles away.

Now we know that we are not only in the 1st sphere but also on the second sphere of 11,000 miles. Which means we are somewhere on the intersection points on two circles.

Step 3:

Now if we measure our distance from the third satellite and it turn outs to be 13,000miles, so now we know that we are on the 3 circles circumference and the point where 3 circles intersect is the place where we are on the earth.[1,2,3]

IV. PSEUDO CODE

Inputs:

- 1) Source: The starting Location of the trip or the current location of the user.



2) Destination: The ultimate point user wants to reach.

Data Base: Example tables

1) Route Table

Bus Route Number	Places
131	Uttam Nagar, Janakpuri, TilakNagar,Subhash Nagar, Tagor Garden,RajoriGarden,Ramesh Nagar, Moti Nagar, Kirti Nagar.. etc
321	Ads,fgdf.....etc

Table 1. Route table

2) Bus Table

Bus Number	GPS Tracker No.	Bus Route Number	Live Status
DL 1PC 8432	9874545321	131	YES
DL 1PC 0683	9875357643	419	YES
DL 1PC 0084	9873446742	131	NO

Table 2. Bus table

Code:

If (Source == Current Location)

{

 Source = Current Location (co-ordinates)

}

Else

{

 Search Source in Route table

 If (Not Found)

 Return (“Place Not Found! Please check again”)

 Else

 Source = Entered Value(co-ordinates)

}

Search Destination in Route Table

If (Not Found)

 Return (“Place Not Found! Please Check again”)

Else

 Destination = Entered Value (Co-ordinates)

Get (Route No.) // Equivalent to destination in Route Table

Create (Path b/w Source And Destination)

```
Go to (Bus Table)
While (Route No. Bus == Live)
{
    Plot Buses Current Location on map
}
For each (Live Bus Plotted)
{
    While (Bus== Live)
    {
        Get (Distance B/W Bus and User)
        Get (Speed of Bus)
        Return (Time it will take to reach person)
    }
}
```

Firstly user will enter the source location or take source as the current location of the user. The user can enter the location by typing into an application or by just pointing on the map. The second thing user need to do is to enter the destination, this can also be done by typing into the application or just by pointing into map provided by the application. RBLS(Real Time Bus Location System) will search the route in the data base. And will provide the buses on that route. The system will plot all the relevant buses with respect to the user with the time they will take to reach the user. The system will show the real time movement of the bus on a map. This will be achieved by having GPS tracker in all the buses in the system.

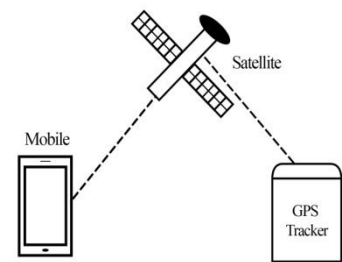


Fig. 1

Imagine you are standing somewhere on Earth with three satellites in the sky above you. If you know how far away you are from satellite S1, then you know you must be located somewhere on the red circle. If you do the same for satellites S2 and S3, you can work out your location by seeing where the three circles intersect. This is just what your GPS receiver does, although it uses overlapping spheres rather than circles. The more satellites there are above the horizon the more accurately your GPS unit can determine where you are. And because of GPS tracker in the bus, we will get the speed of bus as well. With the help of it, we will tell how long it would take the bus to reach the user.

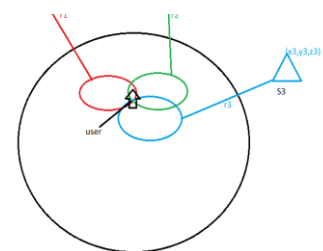


Fig. 2

V.CONCLUSION

Real Time Bus Locating System has endless possibilities. The biggest advantage of this system is uniting the whole country's public transport. Traveling in different cities will be like traveling in one's native city. Because of the ease brought by this system will result in more use of public transport. More use of public transport will reduce traffic which in result reduces pollution. Limitation of this system in that if any device gets off or corrupted, it cannot be tracked anymore.

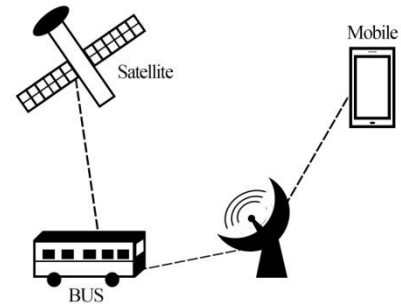


Fig. 3

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