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Research paper

Visual Safe Road Travel App Over Google Maps About the Traffic and External Conditions

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Abstract

In travelling on the roads, Most of our people might get accidents because of lack of road awareness and the traffic potential, also this unpredicted traffic leads to delay in the predicted travel duration. To avoid this kind of odd experiences, the proposed work focuses on the vehicle load characteristics in the available road paths traffic that is existing in the distance of 2-3 kilometers. The characteristics dealt here are vehicle load moving in the same direction as well as vehicle load moving in the opposite direction, danger zones, any wild turns, floods status on the road, group of animals crossing or on the road, any road works intimation, any bridges or flyover conditions, any situational areas like forests, high mountains, lack of public in the areas in the coming 2-3 kilometers in that road if it is two way path in the same road or separate paths infrastructure available. This is more secure because authorized users only will use this kind of facility where users are authorized by their Unique aadhar Number along with their family member details.

Keywords:*Traffic, road, vehicle, sensors, notification, dynamism.*

1. Introduction

Earlier, many methodologies are used in order to show the paths while moving on a road. The methods classified are manual method, software based , and Upgraded software based over google maps. Each method has disadvantages and advantages in their usage. The following are the descriptions of each and individual method used when travelling in a vehicle on a road. First is manual method in which there is no software to predict the traffic conditions about the road when travelling in a vehicle. This leads to many accidents, also leads to reach wrong destinations and is dependent on the information marks placed in the road. The second approach is software based called google maps requires internet facility on the mobile. This method shows the directions in order to reach the destination. This method also shows less traffic paths in the route given from source to destination. This method has disadvantage which is suffered from showing of actual vehicle load and crossing of any group or wild animals in the road, and other conditions.

The third approach is upgraded and is named as safe travel app over the second approach. In earlier methods, there is no visual intimation about traffic or animal crossing status in advance that covering 2-3 kilometers distance in the road the vehicle is travelling. Now-a-days, google maps became very popular and serving its best to the all kinds of drivers in taking diversions about the unreliable traffic and directions towards reaching the destination through voice announcement. This proposed approach working procedure is to be demonstrated in the Proposed Methodology chapter in detail. It requires the pseudo code that explains the upgraded software functionality.

The following are the methods used in travelling on a road:

Table 1. Comparison of methods used for solution

Method Name	Disadvantage	Advantage
Manual method	1) Does not has software to predict the directions 2) Must follow name boards showing directions and places	No need of any server because of no internet
Software based (google maps)	1) Internet is must. 2) Still need improvement in showing the traffic load in the next coming range of distance	1) Prediction of directions towards the destination. 2) Comfortable to the unknown users.
Advanced upgraded Software based (Enhanced google maps)	1) Software costs 2) Only verified users allowed to use this facility. 3) Internet is must.	1) More safety to the all kinds of users who got authenticated. 2) Advance prediction of varying traffic load in the coming 2-3 kilometers range. 3) Marking of status information about any dangers in the road.

2. Proposed Methodology

Here, the functionality of upgraded software based approach over google maps to be presented through architecture by taking second approach called software based approach discussed in the Introduction chapter. Here, first the software based approach is demonstrated and then upgraded software based to be discussed. The methodology of software based over internet based google maps is as follows:

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Pseudo_Procedure softwarebased_maps(byte[][] *GPSdata, String Source, String destination, Maps *paths):

1. pickup the static paths and store in paths variable between source and destination.
2. Based on GPSData obtained from the satellite, show up markups for the directions in the path.
3. Specify also prediction time to reach the destination and also traffic load in the paths to reach the destination.
4. Close the connection when reaches loaded point in the destination.

In the above method, the advantage of this is there were many users using this software which won't reduce performance of this software. At a time, many users can access the information from the google maps in terms of routes, traffic and few external conditions. The lack of this method falls in advance intimation about features such as speed breaks, animal crossing a road, status of heavy trucks travelling in the road, status of floods that damaged the road in a specific route, old and new bridges status when they are outdated, intimation of any accidents spots occurred because of humen errors while driving and other useful activities. All these are generated and reported dynamically in the upgraded featured software based app based on google maps.

There are lot of people under google registering each and every place and spots in the maps software. Hence, the upgraded featured software based intimates about any of these statuses in advance as marks and also as voice in the travelling in a specific road.

The following shows the working of maps based software:

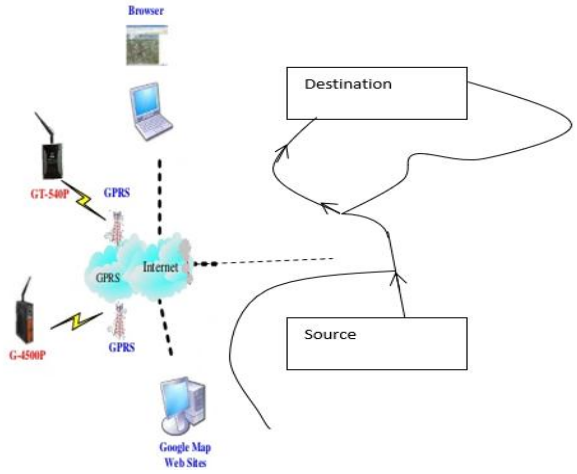


Fig.1. Software based map working architecture

The modules involved here are GPRS and receiver devices, internet, mobiles or cell phones and google map front end software(shown as a map with directed arrows in the route towards reaching the destination). All these modules are to be interacted with one another in determining the path between given source and destination places. In this software app, there is no intimation about road conditions such as wild turns, speed breakers places, construction work places, accident happened spots just before, group of animals crossing the road, bridges status, vehicles load in the route covering a specific distance range, etc.

To bring the specific features in the existing software, upgradation is required over the software that we are using. The pseudo code procedure for the upgraded futuristic software is as follows:

Pseudo_Procedure Upgraded_featured_software(byte[][] *GPSdata,String Source, String destination, [String anotheraddress],byte[][] *dynamicdata, color[] marks):
1. Select first the source and destination in the upgraded feature software.

2. First path is created between source and destination, while the vehicle is moving towards destination, marks as shown in the map regarding the information like animals or school kids or any humen are crossing the road in about coming 2-3 kilometers using GPS Satellite data available in dynamicdata dataset.

3. Simultaneously, another address route details also be possible to watch along with present route details by allowing your friend as a guest. The maximum number of guests allowed under an authenticated user is assumed now is 5. This may be increased based on service charge they will pay online. For free service, maximum number of users assumed is 5.

4. Colored markers will be visible by suing marks variable of type color depending on activity identified in the travelling of a road, yellow is used to indicate flyover, green is to indicate animal crossing the road, white is to indicate speed breaker spot in the road, grey is to indicate accident occurred spot and etc.

5. Use Iterator object, addObject() is used in the specific range of distance to show the count of vehicles. This can be refreshed after every 1.5 kilometers range.

6. The authenticated user connection closes after the safe reach out of the destination.

There were colored marks are used depending on activity identified in the travelling of a road, yellow is used to indicate flyover, green is to indicate animal crossing the road, white is to indicate speed breaker spot in the road, grey is to indicate accident occurred spot and etc. These assumed colors taken for the mark positions indicate that customization of the up-gradation of this app.

The following is the architecture of proposed methodology called visual safe travel app:

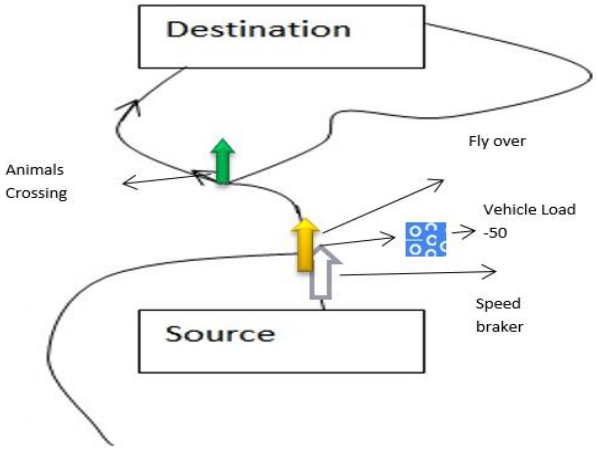


Fig.2. Frond end snapshot of Proposed Software based map

In the above proposed work, the marks plays vital role indicating the status about many things connected to the road. The passenger / user might aware of them and be conscious in going ahead in driving. In this, satellite signal provides all the road conditions within the 2-3 kilometers range and this information is dynamically displaying to the end user. The GPRS technology places the vehicle movement in the road towards the destination.

This proposed approach may also allow maximum of 5 routes by inviting each friend with valid credentials.

The working model of proposed work is depicted in the following diagram:

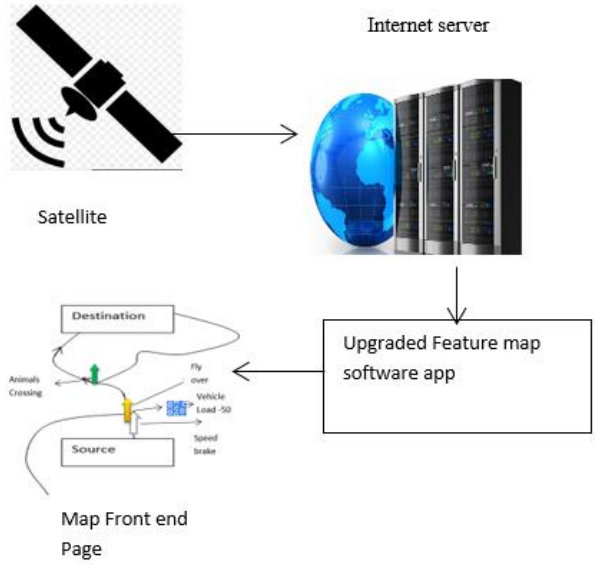


Fig.3. working architecture of Proposed Software based map

In the above proposed model, first module is satellite from which objects on a specific road are dynamically updated, refreshed whenever a change of details is required and show it on a front end map, second module is internet server from which satellite information is stored and transmitted, third is proposed software takes the output information of server and dumps in the fourth module named front page map as colored marks.

The performance of the proposed model is increased because of higher quality objects are used as modules.

The results of this proposed and existing methodology are to be specified in the results Chapter.

3. Results

The existing methodology named software based maps without much dynamic updated features is applied between a route Narayanavanam, Puttur to Tirupathi, Chittoor(dt),Andhra Pradesh. The output is obtained as follows:

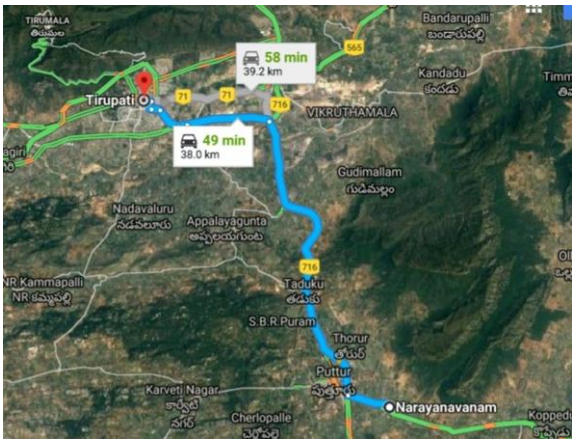


Fig.4. Output of existing Software based map

For the same route, when proposed software feature map is applied results the following output with many features demonstrating about objects connected in a road in which vehicle is travelling

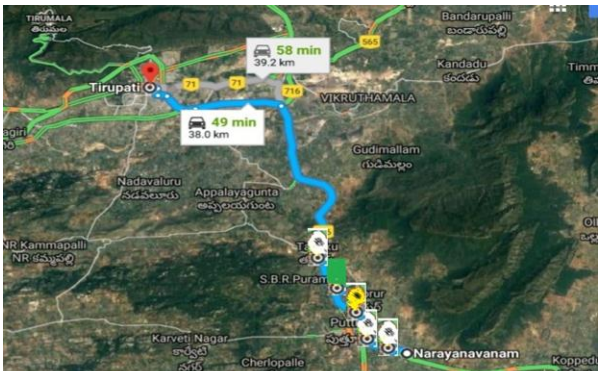


Fig.5. Output of proposed Software feature based map

In the above outputs, the proposed methodology output will convey best features which might be helpful to the targeted user who is using upgraded app.

4. Conclusion

The proposed software based feature app will produce many external conditions features to the end user. This information will benefit the targeted user in safe road travelling. The features covered are animal crossing, speed breakers, any heavy trucks, fly overs, floods and other activities during the travelling. The performance of the proposed method is better than the existing software based maps. The most achieved benefits are More safety to the all kinds of users who got authenticated, Advance prediction of varying traffic load in the coming 2-3 kilometers range and Marking of status information about road conditions or any dangers in the road through colored marks as well as through the voice.

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