User Request Traffic Condition Providing System for using Location Information

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Keywords: Traffic Condition, Location Information, ITS.

Abstract: With respect to traditional method which relates to identifying a traffic state of a particular road from a remote point, there is a scheme for collecting data sensed by a traffic sensing apparatus of a freeway traffic management system(FTMS), such as a loop type vehicle detector, which is provided on a road to detect traffic states, a video type vehicle sensor, Which is configured to identify traffic states on a road through the use of video photographing, a closed circuit television (CCTV), and an emergency call.. The FTMS is a freeway intelligent traffic system (ITS) constructed by the Korea Highway Corporation to provide users of a freeway with exact road information and to manage traffic conditions. However, in order to implement a system for measuring a speed of a vehicle by using the loop type detection system, installation of a loop coil detector typically requires earthworks and/or other types of construction, thereby causing delay and/or inconvenience in transportation during the earthworks and/or construction. Further, in order to collect information, it is typically necessary to install a separate private cable or to lease a dedicated line. In this paper, we describe a system for detecting a peripherally located vehicle based on a location of a user or a particular point on a map which point is selected by a user, so as to be provided with traffic images captured by a smart device installed in the detected vehicle.

1 INTRODUCTION

Traditional traffic sensing system, it is not possible to identify an exact speed of a vehicle, i.e., traffic volume information, at a point where no speed sensor exists. In order to sense the traffic volume, a large number of speed sensors should be provided on each road. As a result, the number of communication lines increases, and the resultant burden of installation costs and lease fees for communication increases. The aforementioned method for using a CCTV camera is limited, because traffic information can be identified only at a point where a CCTV camera is provided.

A typical traditional method "System for Providing Road Traffic Images," describes detecting peripherally located vehicles based on location of a user and purchasing moving images captured in any one of the detected vehicles. However, this technology relates to enabling a service server to send a traffic image purchase request to a multiple number of vehicles which are located in relatively close proximity to the user and an intermediate communication between the user and a vehicle which first responds to the request.

Accordingly, in the above-described system, it is not possible to obtain traffic images from a vehicle which is located at a point selected by the user. Further, because a certain amount of costs are paid for provided traffic images, the user may experience monetary damages resulting from receiving unnecessary traffic images.

Smartphones are important part of daily life of people now. Those provide technology which helps to make human life simpler, easier, and faster. So the smartphones are used to provide service for saving the time by use of application of getting better routes to travel. Smartphones have several advantages for data collection in intelligent transportation service (ITS). ITS of smartphone-based method can have significantly lower cost and larger coverage compared to traditional transportation service based on roadside infrastructures or dedicated on-board units. The increasing smartphone penetration has also the potential of providing a huge traffic probe base.

Heo, S-P., Lim, W., Hur, S-C. and Kim, D-S.
User Request Traffic Condition Providing System for using Location Information.
In *Proceedings of the 18th International Conference on Enterprise Information Systems (ICEIS 2016) - Volume 2*, pages 194-198
ISBN: 978-989-758-187-8

In order to address the above-described conventional problems, we propose a method for detecting a peripherally located vehicle based on a location of a user or a particular point on a map which point is selected by a user, so as to be provided with traffic images captured by a device installed in the detected vehicle. An exemplary embodiment also provides an apparatus which enables a user to directly select a vehicle, from which traffic images are provided.

2 TRAFFIC INFORMATION PROVIDING SYSTEM BASED ON USER REQUEST

In the traditional traffic information providing systems which are working on the similar concept of traffic detection and management, different approaches are used as sensors, GPS, social networking etc. In the method of using sensor, the sensor is mounted simply on the signal poles or placed alongside the roads where they sense the vehicles passing by the mounted sensors. The data collected by system using these sensors is then utilized to provide users information about the traffic conditions and suggesting routes to manage the traffic.

The LBS (Location Based Services) gives the geographical location of devices executing application and provide the services based on the information of location. LBS gives the real time location. So it can be used to get the real time traffic on the routes and avoid the jams.

Use of social networking is the new emerging field. As the number of people using social networking sites are increasing day by day, this method can become a successful way to provide traffic updates to them. Drivers will post about the traffic conditions of roads.

A user directly may select one of the detected vehicles to request traffic images, such that traffic states relating to the corresponding point can be identified and/or described in detail. A certain amount of costs may be paid to the driver of a vehicle providing traffic images, such that the driver may obtain additional income. Furthermore, providing and using traffic images can be promoted, for example, via advertisement and/or public service announcement. In case of occurrence of an emergency circumstance, such as, for example, a traffic accident or a vehicle violating the traffic rules, traffic images captured from a peripheral vehicle may be provided to a related organization such that the captured traffic images may be used for news reporting or evidence.

Figure 1 is proposed system configuration for providing traffic information by using location information. The system is made up user device, vehicle device, and a traffic information providing server.

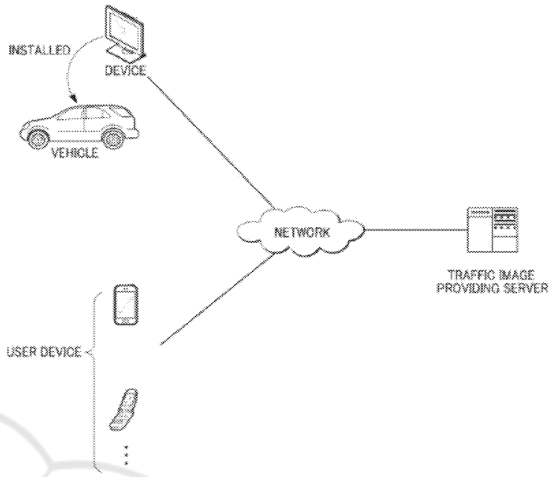

Figure 1: Overview of proposed system.

The user device may include an application which provides traffic images to a user of the user device. An icon or menu form corresponding to the application is displayed on the screen of the device. When the user selects the icon or menu, the application provides traffic images. Hereinafter, the operation of the user device to provide traffic images via activation of the application installed in the user device will be described.

Once the application is activated, the user device requests a traffic image service from the traffic image providing server via a network connection. In particular, the user device may send information relating to a location of the user device, such as, global positioning system (GPS) coordinate-based location information, cell-based location information, WiFi-based location information, or any other suitable type of location information, to the traffic image providing server.

Figure 2 is a flow chart which illustrates a process for providing traffic images.

The vehicle device displays the traffic image request of the user device on the screen, and sends a selection of the driver in response to the traffic image request, i.e., selection information relating to an indication of acceptance of the traffic image request or information relating to an indication of refusal of the traffic image request to the traffic image providing server.

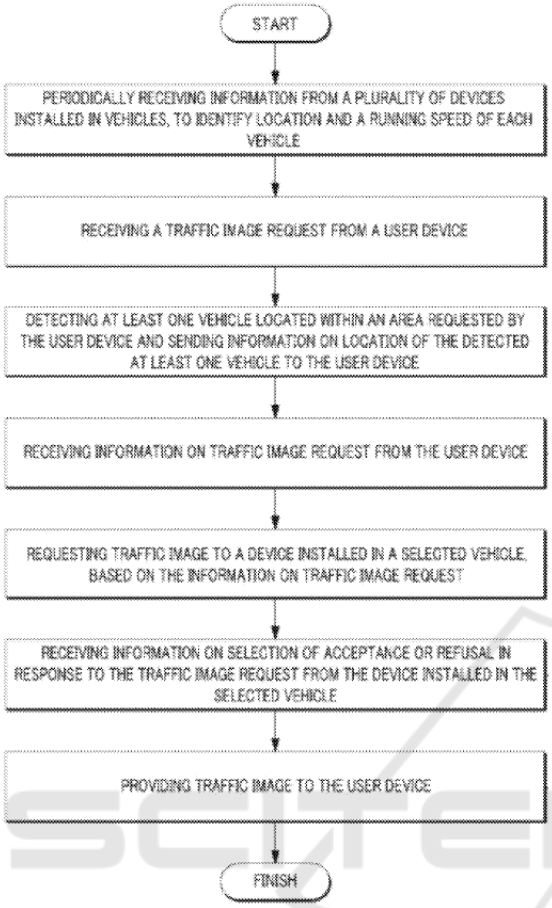

Figure 2: Flow chart of proposed system.

If the driver accepts the traffic image request, the device captures the periphery of the vehicle for a predetermined period of time. For example, if the driver accepts the traffic image request, the vehicle device captures the periphery of the vehicle. Thereafter, the vehicle device sends the captured traffic images to the traffic image providing server.

3 MECHNISM OF TRAFFIC CONDITION PROVIDING SYSTEM

Now days GPS is used mostly in the applications that work on location based services. GPS technology is easily available on the mobiles. This technology used along with mobile network in smart phones gives better accuracy than other methods. It gives location in few seconds and has better coverage.

A server for providing a traffic image to a user device includes a location information receiving unit which receives information relating to a respective location of each of a plurality of vehicles. A location management unit which receives information relating to a particular area from a user device, and which detects at least one vehicle located within the particular area based on the location information.

An information sending unit which sends information relating to the at least one detected vehicle to the user device, an image requesting unit which receives information relating to a vehicle selected from among the at least one detected vehicle from the user device, and which requests, from a device installed in the selected vehicle, transmission of a traffic image of the selected vehicle, and an image providing unit which receives the image and which provides the traffic image to the user device.

The vehicle device displays the traffic image request of the user device on the screen, and sends a selection of the driver in response to the traffic image request, i.e., selection information relating to an indication of acceptance of the traffic image request or information relating to an indication of refusal of the traffic image request to the traffic image providing server. If the driver accepts the traffic image request, the device captures the periphery of the vehicle for a predetermined period of time. For example, if the driver accepts the traffic image request, the vehicle device captures the periphery of the vehicle. Thereafter, the vehicle device sends the captured traffic images to the traffic image providing server.

Figure 3 is a block diagram which illustrates a configuration of a device for providing traffic images, according to an exemplary embodiment. Figure 4 is a block diagram which illustrates a configuration of a traffic image providing server for providing.

According to the above-described aspects of the exemplary embodiments, it is possible to detect peripherally located vehicles based on a location of a user or a particular point on a map which is selected by a user. A user directly may select one of the detected vehicles to request traffic images, such that traffic states relating to the corresponding point can be identified and/or described in detail.

A certain amount of costs may be paid to the driver of a vehicle providing traffic images, such that the driver may obtain additional income. Furthermore, providing and using traffic images can be promoted, for example, via advertisement and/ or public service announcement.

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to a related organization such that the captured traffic images may be used for news reporting or evidence.

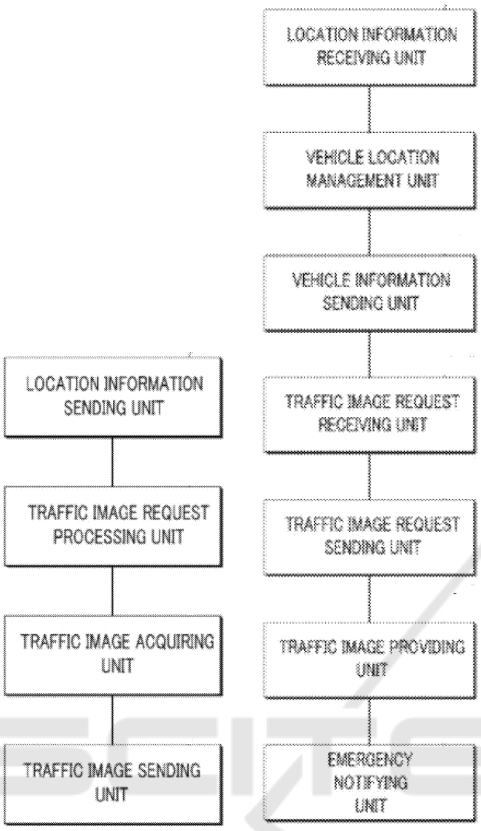

Figure 3, 4: Block diagram of location information sending and providing unit.

Figure 5 is a view which illustrates coordinate information relating to points on a map of a user device that corresponds to comers of a screen, according to an exemplary embodiment.

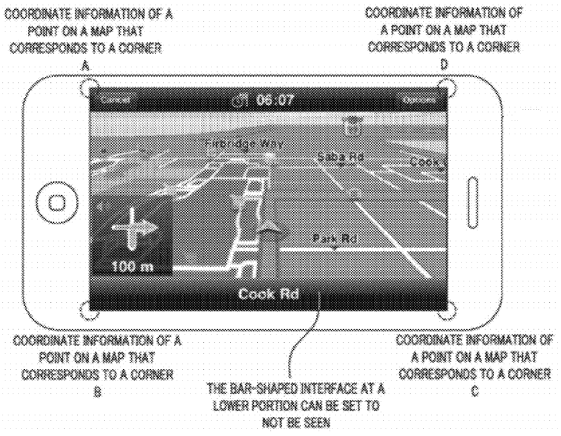

Figure 5: Illustrates coordinate information relating to points on a map of a user device.

Figure 6 is illustrated a traffic information request-related interface which is displayed on a user device. Figure 7 is illustrated a screen shot of a vehicle device.

Figure 6: illustrated a traffic information request-related interface.

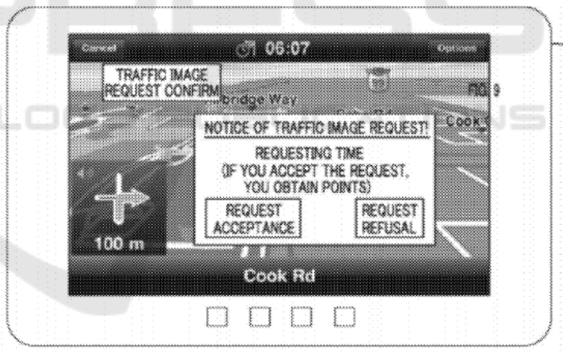

Figure 7: Vehicle device.

4 CONCLUSIONS

Smartphones have several advantages for data collection in intelligent transportation service (ITS). ITS of smartphone-based method can have significantly lower cost and larger coverage compared to traditional transportation service based on roadside infrastructures or dedicated on-board units. The increasing smartphone penetration has also the potential of providing a huge traffic probe base.

In this paper, we described a system for detecting a peripherally located vehicle based on a location of

a user or a particular point on a map which point was selected by a user, so as to be provided with traffic images captured by a smart device installed in the detected vehicle.

A server for providing a traffic image to a user device includes a location information receiving unit which receives information relating to a respective location of each of a plurality of vehicles, a location management unit which receives information relating to a particular area from a user device, and which detects at least one vehicle located within the particular area based on the location information. An information sending unit which sends information relating to the at least one detected vehicle to the user device, an image requesting unit which receives information relating to a vehicle selected from among the at least one detected vehicle from the user device, and which requests, from a device installed in the selected vehicle, transmission of a traffic image of the selected vehicle, and an image providing unit Which receives the image and which provides the traffic image to the user device.

ACKNOWLEDGEMENTS

This research was supported by 'Software Convergence Cluster Program', through the Ministry of Science, ICT and Future Planning (2015-GSWC-16).

This research was supported by the MSIP (Ministry of Science, ICT and Future Planning), Korea, under the C-ITRC (Convergence Information Technology Research Center) (IITP-2015-H8601-15-1011) supervised by the IITP (Institute for Information & communications Technology Promotion)

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