THE METHOD FOR SETTING DESTINATION BASED ON IDENTIFIER OF MOVING OBJECT

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ABSTRACT ... In this study, we propose a system for setting a Destination on CNS(Car Navigation System) or PNS(Personal Navigation System). The present Navigation does set the destination by only static method like name search, address search and wire telegraph telephone number search. But, the kind of setting a static destination does not reflect the dynamic moving situation. So we suggest setting the destination of navigation using Identifier of moving terminal. And it includes privacy protection on personal position information

KEY WORDS: Telematics, Navigation, Path Guide, CNS, PNS

1. INTRODUCTION

According to a communication technology, if a current position and a destination are inputted to a telematics terminal, a path guide (in other words, navigation) service, which calculates an optimum path and the shortest path from the current position to the destination and provides a user with the optimum path and the shortest path as an image and a sound, is normalized. A name, an address and a telephone number are searched in order to set the destination.

Meanwhile, the difference between telematics terminal and a general navigation terminal is to have a communication module. IS-95A/B, a code division multiple access (CDMA 1x/EvDO/EVDV), a global system for mobile communication (GSM), a general packet radio service (GPRS), a wide-CDMA (WCDMA), a universal mobile telecommunications systems (UMTS) and a wireless LAN (WLAN) are used as the communication module. A high speed downlink packet access (HSDPA), a wireless broadband internet (WiBro), an ultra wand band (UWB), a broadband convergence network (BCN) and 4-generation mobile communication will be available to the communication module.

It is necessary to obtain position of a telematics terminal in order to provide a telematics service. A technology which obtains a position of a telematics terminal for providing a telematics service is a position determination technology (PDT). The PDT includes a network-based PDT which obtains the position of the telematics terminal based on a position of a base station, a handset-based PDT which tracks the position of the telematics terminal based on a satellite signal, a hybrid PDT which increases position accuracy by combining the network-based PDT and the handset-based PDT. Moreover, a sensor-based PDT which tracks a position of the telematics terminal using a position sensor according to the high performance and the variety of the sensor is developed.

The network-based PDT uses an angle of arrival (AOA), a time of arrival (TOA), a time difference of arrival (TDOA). The handset-based PDT includes a navigation satellite position determination system, e.g., a global positioning system (GPS), a Galileo and a global navigation satellite system (GLONASS), and a dead reckoning (DR) system as an inertial navigation apparatus using a gyro sensor, a wheel sensor, a speed sensor, and an acceleration sensor for removing a shadow region and increasing accuracy of a satellite position determination system.

Moreover, a location based service (LBS) has been activated recently. A current telematics terminal includes a telematics terminal for a vehicle and a portable telematics terminal. Accordingly, a technology, which receives position information of a moving terminal (in other words, moving object) and searches a path, may be requested.

In this paper, we suggest a method for setting a destination based on an identifier of a moving object (Car, Phone) and protection personal information identifier search of a moving object, searching a path, and providing an authorized person with personal position information when the personal position information is requested.

2. ARCHITECTURE

As shown in Figure 1, the telematics service system includes a first telematics terminal, a second(target) telematics terminal, a personal position information protecting server(or module), a location based service (LBS) server, a telematics service server, and a real time traffic information providing server.

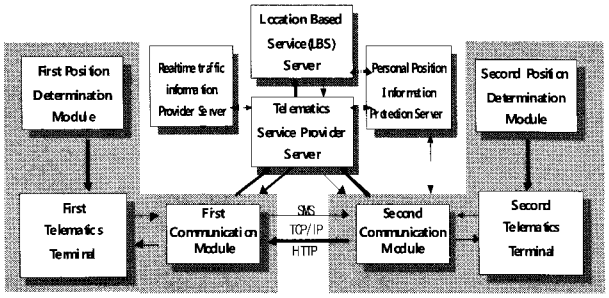


Figure1. Telematics Service System

The telematics service server communicates with the LBS server and the real time traffic information providing server, and transmits corresponding information to the first telematics terminal and the second telematics terminal.

In another embodiment of the present paper, the first telematics terminal, the second telematics terminal, the LBS server and the real time traffic information providing server may be directly connected to each other. The personal position information protecting server(or module) may be included in the first telematics terminal and the second telematics terminal. Moreover, the personal position information protecting server(or module) may be included in the LBS server or the telematics service server .

The first telematics terminal using a first communication module transceives information from/to the second telematics terminal using a second communication module through a short message service (SMS), a transmission control protocol/internet protocol (TCP/IP) and a hypertext transfer protocol (HTTP).

That is, the first telematics terminal receives position information from the second telematics terminal, and checks a current position of the first telematics terminal through a first position determination module. The first telematics terminal provides a user with a path guide service by setting the position information of the first telematics terminal and the second telematics terminal as a start point and a destination respectively. The first telematics terminal may provide the path guide service based on the traffic information which is received from the real time traffic information providing server.

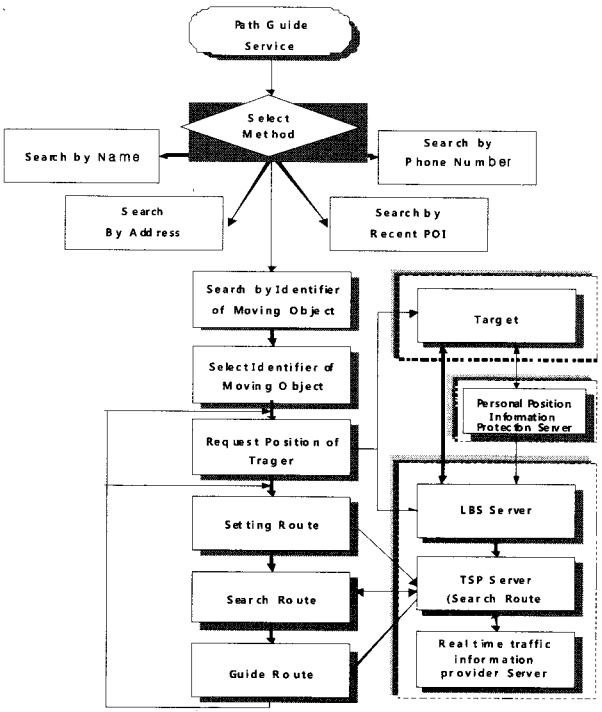


Figure2. The Step for a method for setting a destination

Figure 2 is a flowchart describing a method for setting a destination based on an identifier of a moving object. The first telematics terminal drives a path guide service program according to an user input and receives a destination setting method. A various application services for requesting position information of the telematics terminal may be started according to an external input. The sort of the destination setting method is determined.

The identifier of the moving object as the destination setting method is provided in addition to a name, an address, a telephone number and a recent destination as a conventional destination setting method. An object terminal, a second telemactics terminal, is identified by the identifier of the moving object, e.g., a mobile telephone number and a mobile identification number (MIN) and a fixed internet protocol (IP) address.

If the conventional destination setting method is determined as the sort of the destination setting method, the position information providing service is processed by a conventional method. If the identifier of the moving object is determined as the sort of the destination setting method, the identifier of the moving object is searched and selected. The first telematics terminal requests the position information of the second telematics terminal. The first communication module of the first telematics terminal transceives various requests and information by communicating with the second communication module of the second telematics terminal through a short message service (SMS), a transmission control protocol/internet protocol (TCP/IP) and a hypertext transfer protocol (HTTP).

Then, the first telematics terminal receives the position information of the second telematics terminal from the second telematics terminal. The first telematics terminal determines a start point and a destination based on the current position information of the first telematics terminal, which is obtained by the first determination module, and the received position information of the second telematics terminal. That is, a path between the start point and the destination is set. A path, e.g., a minimum path or an optimum path is searched. A path guide service is provided to a user. The path guide service includes multimedia data such as an image or a sound. If the moving object is deviated from the path or an extraordinary situation occurs, the path setting and the path search process are repeated.

The traffic information provided from the real time traffic information providing server may be reflected on the path search. If the path search is not performed smoothly by a limitation of a CPU or a memory of the first telematics terminal, the telematics service server may perform the path search and provide the first telematics terminal with the result of the path search.

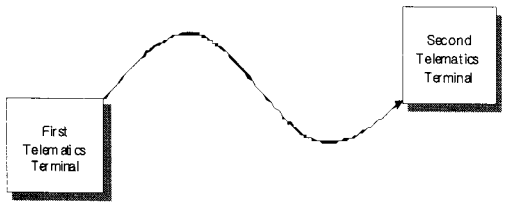
Figure 3-A to 3-C are block diagrams showing a path search according to a moving state of an object terminal.

Figure 3-A shows a path search in the first telematics terminal in a case that a second is on standby at a specific position for an emergency rescue or an emergency call. If

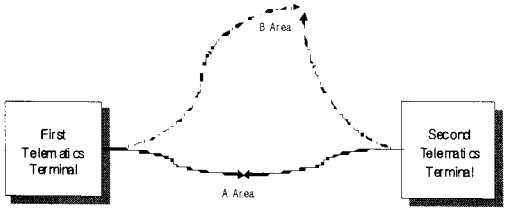
the second starts to move, the second transmits the position information (moving information) of the second telematics terminal to the first telematics terminal based on the information protection.

Figure 3-B shows a path search in a case that the first telematics terminal and the second move respectively and search a path between a start point and a middle place (A area) or a meeting place. The middle place denotes a temporal middle point, which reflects a traffic situation, such as a parking area and a point of interest (POI). The meeting place denotes a specific place which is designated by the first and second telematics terminals. A destination is set based on post-position information on a moving path and necessary time information between the current position and the post-position.

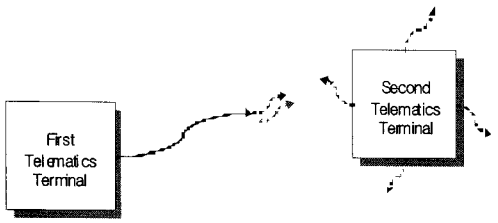
Figure 3-C shows a path search of the first telematics terminal when a moving path of the second telematics terminal is unknown. The position information of the second telematics terminal is updated periodically or non-periodically and is transmitted to the first telematics terminal. The path setting and the path search process are repeated.



(a) When target is on standby



(b) When source and target respectively search a path to a middle place (A area) or a meeting place (B area).



(c) Path Guide with no destination Information of a target object

Figure3. A path search according to a moving state of an object terminal

3. THE POLICY OF PRIVACY PROTECTION

In this chapter, we present a method for providing position information in accordance with position information based on checked position information providing level like Figure 4. The second telematics terminal stores a position information providing table for providing position information of a user. It receives a request of position information providing from the first telematics terminal through the second communication. It retrieves the position information providing and checks whether or not the first is registered on the position information providing. If the registration of the first telematics terminal is confirmed through the position information providing table, the second telematics terminal checks a position information providing level of the first telematics terminal. The position information is provided or refused based on the checked position information providing level of the first.

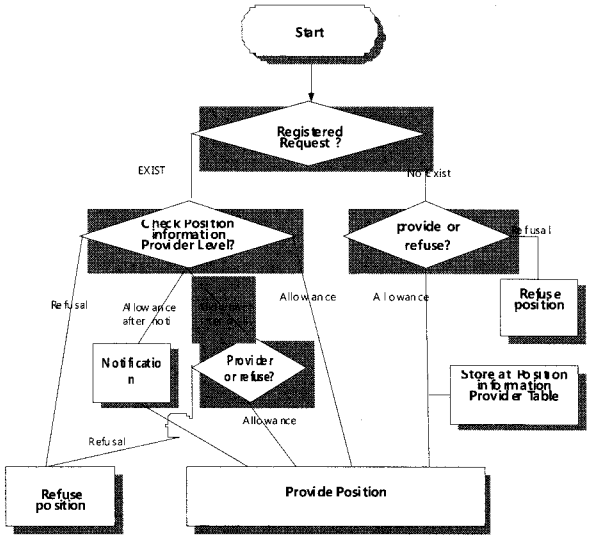


Figure4. a method for providing position information

The position information providing levels include four levels, "refusal of position information providing (always refusal)", "position information providing after agreement (allowance after agreement)", "position information providing after notification (allowance after notification)" and "position information providing (always allowance). If the position information providing level of the first telematics terminal is the "refusal of position information providing", the position information is not provided to the first.

If the level of the first terminal is the "position information providing after agreement (allowance after agreement)", the position information is provided or refused after the second terminal requests a user an agreement regarding the position information providing.

If that of the first terminal is "position information providing after notification (allowance after notification)", the position information is provided to the first terminal after the second terminal notifies the position information providing to the first terminal.

If that of the first terminal is "position information providing (always allowance)", the position information is provided to the first terminal.

If the registration of the first terminal is not confirmed through the position information providing table, the position information is provided or refused after the second terminal requests an agreement of a user regarding position information providing to a user.Then, theposition information is registered on the position information providing table according to an input of the user.

Table 1 shows a position information providing table for providing personal position information.

Subscribe		Service	Requester	Position Information	Providing Period		ETC
Identifier	NickName	Name	Identifier	Providing level	Start	End	(Exception)
010-1111-1111	Hong,-GilDong	Path Guide (Position)	010-1234-5678	Always Allowance	08-10-01 01:10:00	10-12-31 24:00:00	
			010-1234-5679	Allowance after notification	08-10-02 00:00:00	10-12-31 01:23:45	
			010-1234-5679	Allowance after Agreement	08-10-02 00:00:00	08-12-31 01:10:45	
			010-9999-9999	Always Refusal	08-10-02 00:00:00	10-12-31 01:23:45	
		Current Position Providing	ALL	Always Allowance	08-10-02 00:00:00	08-10-31 24:00:00	
010-9999-9999	Hong-GilSoon	Current Position Providing	ALL	Always Refusal	08-10-02 00:00:00	99-12-31 24:00:00	

Table1. The table for providing personal position information

The position information providing levels in the position information providing table may be changed according to a combination of each field in the position information providing levels, e.g., a subscriber (e.g. identifier and nick name), an application service (e.g. path guide service, position information providing service), a requester (e.g. identifier), a providing period (e.g. start and end) and etc (e.g. exception).

That is, since various fields are set and the position information providing levels are changed according to the combination of the fields, different position information providing levels, which are classified by each requester, service, and time period, may be provided.

The position information providing levels may be provided step by step. For example, although the same requester requests position information for same application service, a part or whole levels of the position information providing levels may be provided according to a requesting time.

In detail, the second terminal checks an identifier, the sort of application service (e.g., path guide service and position information providing service) and a providing period of the first terminal, and performs an operation based on the position information providing levels in which the first terminal is included by receiving the request of position information from the first terminal.

For example, if the second terminal receives a request of position information from the first terminal having an identifier of "010-1234-5678", the second confirms the providing period and the application service sorts, and provides the first terminal with the position information directly without the agreement process of a user according to the validation of the confirmed result.

For example, if the second terminal receives a request of position information from the first having an identifier of "010-9999-9999", the second telematics confirms the providing period and the application service sorts, and refuses a request of position information providing of the first without the agreement process of the user according to the sameness with the data recorded in the position information providing table.

In a case of the etc(e.g. exception) filed, an exception case and an application rule of the position information providing level are defined by an extra format.

In a case that the second telematics terminal does not have the second position determination module, the second may receive the position information of the second from the LBS server, and provide the first with the received position information.

In a case that the second telematics terminal does not have the second position determination module, the second telematics terminal may allow the first to receive the position information of the second from the LBS server directly.

As described above, we provide a path guide service between a start position and a dynamic destination by setting a destination through an identifier search of a moving object(telematics terminal for a vehicle or a portable telematics terminal), and protects personal position information by providing the position information according to the position information providing level.

4. CONCLUSION

In this paper, we present a method for setting a destination based on an identifier of a moving object and a method for providing position information is disclosed. there is provided a method for setting a destination based on an identifier of a moving object, including the steps of: a) selecting an identifier of moving object; b) requesting the providing of position information providing to the selected moving object; c) receiving the position information from the selected moving object; and d) setting a destination for the moving object based on the received position information.

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