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(54) **VEHICLE MONITORING METHOD AND VEHICLE MANAGEMENT SYSTEM**

(57) Embodiments of the present invention disclose a vehicle surveillance method and a vehicle management system. The method includes: receiving information RFID information of a vehicle sent by an RFID collection point, determining that the RFID information of the vehicle meets a preset condition, and recording the information provided by the RFID collection point sending the RFID information of the vehicle; determining a geographical query range according to the geographical position information of the RFID collection point; selecting an NVS camera in the geographical query range according to the determined geographical query range; intercepting, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera; and combining the information provided by the RFID collection point and the intercepted video record.

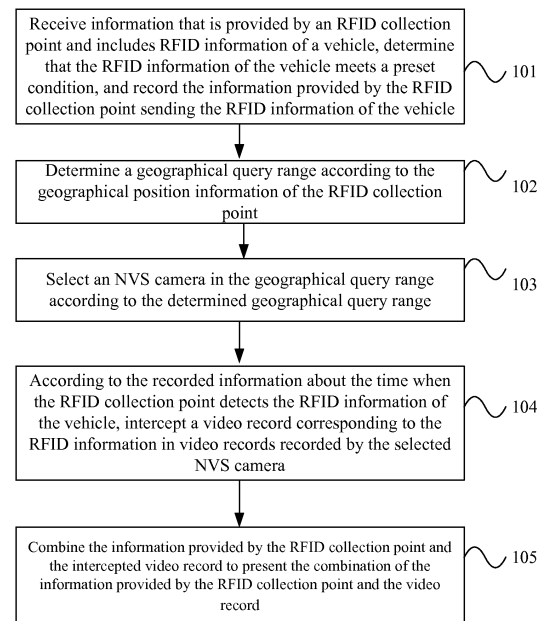


FIG. 1

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Description

[0001] This application claims priority to Chinese Patent Application No. 201110225531.7, filed with the Chinese Patent Office on August 5, 2011 and entitled "VEHICLE SURVEILLANCE METHOD AND VEHICLE MANAGEMENT SYSTEM", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention relates to communication technologies, and in particular, to a vehicle surveillance method and a vehicle management system.

BACKGROUND

[0003] In a vehicle management system (Vehicle Management System, VMS) of an urban security project, an urban vehicle is managed by using a radio frequency identification (Radio Frequency Identification, RFID), that is, an electronic identification. An RFID collection point is arranged in critical areas, such as entrances of cities, urban arterial roads, and main entrances and exits of important buildings, to detect passing vehicles on a real-time basis and record the travel time, travel direction, travel speed, and RFID information of the vehicles. In addition, the RFID collection point compares the RFID information with a blacklist of vehicles stored in the VMS, and generates an alarm if detecting a vehicle consistent with one in the blacklist.

[0004] A network video surveillance system (Network Video Surveillance, NVS) is also built in the urban security project, that is, NVS cameras are installed in critical areas such as entrances of cities, urban arterial roads, and main entrances and exits of important buildings, to perform real-time video surveillance on the roads, and all video records are stored in the NVS.

[0005] In the prior art, because the VMS is separated from the NVS, to view video information corresponding to track information of a vehicle, the VMS needs to be switched to the NVS; a corresponding NVS camera identification is queried from the NVS system according to geographical position information of the RFID collection point; and then specific video information is obtained according to the NVS camera identification and time when an accident happens. Therefore, the query process is very complex and inconvenient.

SUMMARY

[0006] Embodiments of the present invention provide a vehicle surveillance method, system, and apparatus to solve the problem in the prior art that due to the separation of a VMS from an NVS, it is very complex and inconvenient to view corresponding video records according to track information of a vehicle.

[0007] To solve the above technical problem, accord-

ing to one aspect of the present invention, a vehicle surveillance method is provided, including: receiving information that is provided by a radio frequency identification RFID collection point and includes RFID information of a vehicle, determining that the RFID information of the vehicle meets a preset condition, and recording the information provided by the RFID collection point sending the RFID information of the vehicle, where the information provided by the RFID collection point includes geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and the RFID information of the vehicle; determining a geographical query range according to the geographical position information of the RFID collection point; selecting a network video surveillance system NVS camera in the geographical query range according to the determined geographical query range; intercepting, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera; and combining the information provided by the RFID collection point and the intercepted video record.

[0008] According to another aspect of the present invention, a vehicle management system VMS is provided, including a vehicle information recording module, a geographical query range determining module, an information combining module, a camera selecting module, and a video record intercepting module.

[0009] The vehicle information recording module is configured to receive information that is provided by a radio frequency identification RFID collection point and includes RFID information of a vehicle, determine that the RFID information of the vehicle meets a preset condition, and record the information provided by the RFID collection point, where the information provided by the RFID collection point includes geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and the RFID information of the vehicle; the geographical query range determining module is configured to determine a geographical query range according to the geographical position information of the RFID collection point; the camera selecting module is configured to select a network video surveillance NVS camera in the geographical query range according to the determined geographical query range; the video record intercepting module is configured to intercept, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera; and the information combining module is configured to combine the information provided by the RFID collection point and the intercepted video record.

[0010] In the embodiments of the present invention, information provided by an RFID collection point is com-

bined with an intercepted video record, so that a vehicle is presented by using a combination of the information of the RFID collection point and the video record. Therefore, a scene video record can be viewed visually when the information provided by the RFID collection point is viewed, thereby increasing the availability of a system. In addition, when the alarm of a vehicle whose RFID information meets a preset condition is processed, the scene situation can be viewed visually, which makes subsequent processing more convenient.

BRIEF DESCRIPTION OF DRAWINGS

[0011] To describe the technical solutions in the embodiments of the present invention more clearly, the following briefly introduces the accompanying drawings required for describing the embodiments of the present invention. Apparently, the accompanying drawings in the following description show merely some embodiments of the present invention, and persons of ordinary skill in the art may still derive other drawings from these accompanying drawings without creative efforts.

FIG. 1 is a flowchart of a vehicle surveillance method according to an embodiment of the present invention;

FIG. 2 is a flowchart of intercepting a video record corresponding to track information of a vehicle according to an embodiment of the present invention;

FIG. 3 is a schematic diagram of a vehicle management system according to an embodiment of the present invention; and

FIG. 4 is a schematic diagram of a video record intercepting module according to an embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

[0012] The following describes a vehicle surveillance method, system, and apparatus in detail.

[0013] A first embodiment of a vehicle surveillance method is shown in FIG. 3.

[0014] Step 101: Receive information that is provided by a radio frequency identification RFID collection point and includes RFID information of a vehicle, determine that the RFID information of the vehicle meets a preset condition, and record the information provided by the RFID collection point sending the RFID information of the vehicle, where the information provided by the RFID collection point includes geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and the RFID information of the vehicle.

[0015] In a VMS, an RFID collection point arranged in each main intersection and each key position of an urban detects RFID information of a passing vehicle. In the embodiment of the present invention, the RFID collection

point can send the detected RFID information of the passing vehicle to a VMS. Therefore, after receiving the RFID information of a vehicle sent by the RFID collection point, the VMS determines whether the RFID information of the vehicle meets a preset condition, and when the RFID information of the vehicle meets the preset condition, records the information provided by the RFID collection point sending the RFID information of the vehicle. For example, a blacklist of hit-and-run vehicles is stored in the VMS in advance; when the VMS determines that the RFID of a vehicle sent by the RFID collection point is consistent with the RFID information in the blacklist, the VMS records geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and vehicle speed information detected by the RFID collection point. Further, the VMS stores the geographical position information of the RFID collection point, the information about the time when the RFID collection point detects the RFID information of the vehicle, the vehicle speed information detected by the RFID collection point, and the RFID information of the vehicle correspondingly. The geographical position information includes latitude and longitude information and a vector direction of the RFID collection point.

[0016] For example, a vehicle whose RFID information meets a preset condition passes through intersection A of an RFID collection point from east to west, the RFID collection point arranged at intersection A to detect the RFID information of vehicles passing from east to west obtains the RFID information of the vehicle. The latitude and longitude of the RFID collection point are (J1, W1) and its vector direction is from east to west. Therefore, the geographical position information of the RFID collection point recorded by the VMS includes the latitude and longitude information (J1, W1), and the vector direction of the RFID being from east to west, and the time when the RFID collection point detects the RFID information of the vehicle is recorded. In addition, the information provided by the RFID collection point further includes vehicle speed information detected by the RFID collection point; in this case, the VMS also needs to record the vehicle speed information detected by the RFID collection point.

[0017] Step 102: Determine a geographical query range according to the geographical position information of the RFID collection point.

[0018] There are multiple determining manners. For example, a latitude and longitude range is calculated by using the latitude and longitude of the RFID collection point as a center and using a set distance as a radius, and the latitude and longitude range is used as the geographical query range. The set distance is determined according to the density of NVS cameras deployed in a city, for example, the set distance ranges from 200 meters to 500 meters.

[0019] In another example, according to the geographical information of urban roads stored in an existing GIS

of the VMS, each road passing by the RFID collection point is used as the geographical query range. For example, if the RFID collection point is deployed at intersection A, there are seven straight roads to intersection A according to the geographical information of urban roads, and the seven roads are used as the geographical query range. Step 103: Select an NVS camera in the geographical query range according to the determined geographical query range.

[0020] Specifically, the VMS already stores information of each NVS camera, including latitude and longitude information (position information) of each NVS camera, and direction information of each NVS camera. Therefore, the VMS can obtain latitude and longitude information and a direction of each VMS camera in the geographical query range, and select, according to the geographical information of urban roads and the vector direction of the RFID collection point, an NVS camera that matches the RFID collection point. The vector direction of the RFID collection point indicates the travel direction of a vehicle. For example, for a road extending from east to west, the vector direction of the RFID collection point may, on the one hand, indicate whether a vehicle travels from east to west or from west to east, and on the other hand, indicate whether a vehicle at the intersection travels at a straight lane, a left-turn lane, or a right-turn lane, so that the travel direction of the vehicle can be further learned. The NVS camera that matches the RFID collection point means that the video records recorded by the NVS camera may include a video record of a vehicle when the vehicle passes by the RFID collection point or include a video record of a vehicle passing by the RFID collection point. The NVS camera may be either an NVS camera that the vehicle passes by before the vehicle passes by the foregoing RFID collection point or an NVS camera that the vehicle passes by after the vehicle passes by the foregoing RFID collection point. For example, at an intersection, there are four roads that extend to east, south, west, and north directions, respectively, and eight NVS cameras are arranged to monitor both directions of the roads extending to east, south, west, and north directions, where the eight NVS cameras are in the geographical query range. Which NVS camera monitors a direction of a road can be learned according to the latitude and longitude information and directions of the eight NVS cameras in combination with the geographical information of urban roads. If a vehicle travels from the west and turns left to a northbound road, because it is detected, according to the vector direction of the RFID collection point, that the vehicle travels at the left-turn lane, it is determined that the vehicle travels at the northbound road. Therefore, according to the geographical information of urban roads, NVS cameras that monitor the eastbound and southbound roads and NVS cameras that monitor the westbound and northbound roads and whose directions are opposite to the travel direction of the vehicle are excluded, while NVS cameras that monitor the westbound and northbound roads and whose directions

are the same as the travel direction of the vehicle are selected.

[0021] Generally, the NVS cameras are installed at higher positions which are not easily hidden by surrounding buildings. Therefore, video records recorded by an NVS camera located at the track line of a monitored vehicle and whose direction is the same as the travel direction of the vehicle may generally include images of the vehicle. Therefore, according to an implementation manner, the NVS camera which is located at the track line of the vehicle and whose direction is the same as the travel direction of the vehicle may be directly selected. Step 104: According to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, intercept a video record corresponding to the RFID information in the video records recorded by the selected NVS camera. The video record corresponding to the RFID information herein refers to a video record when the vehicle passes by the RFID collection point.

[0022] Specifically, the VMS obtains video records, recorded by the NVS camera, from an NVS system according to the identification of the selected NVS camera, and then intercepts a video record corresponding to the track information of the vehicle from the video records. For details about how to intercept a video record corresponding to the track information of the vehicle from the video records recorded by the NVS camera, reference may be made to the following embodiment illustrated in FIG. 4.

[0023] Step 105: Combine the information provided by the RFID collection point and the intercepted video record to present the combination of the information provided by the RFID collection point and the video record.

[0024] According to the foregoing embodiment, a scene video record can be viewed visually when the information provided by the RFID collection point is viewed, thereby increasing the availability of the system. In addition, when the alarm of a vehicle whose RFID information meets a preset condition is processed, a scene situation can be viewed visually, which makes subsequent processing more convenient.

[0025] FIG. 2 illustrates implementation steps of intercepting a video record corresponding to the RFID information.

[0026] Step 201: Obtain the identification and latitude and longitude information of a selected NVS camera, and calculate a line distance from the selected NVS camera to an RFID collection point according to the latitude and longitude information of the selected NVS camera and the RFID collection point and the geographical information of urban roads.

[0027] For example, the RFID collection point is deployed at intersection A, the NVS camera is installed at intersection C, and a vehicle travels from intersection A to intersection C; a route that the vehicle needs to travel from intersection A to intersection C is determined according to the geographical information of urban roads, and a line distance between intersection A and intersec-

tion C is calculated.

[0028] Step 202: Calculate travel time of the vehicle over the line distance according to the vehicle speed information detected by the RFID collection point and the line distance between the selected NVS camera and the RFID collection point.

[0029] The VMS has a speed detection apparatus at the RFID collection point; when a vehicle passes by the speed detection apparatus, the RFID collection point can obtain the speed of the vehicle. Therefore, after recording the vehicle speed information, the VMS can calculate the travel time of the vehicle over the line distance between the VMS camera and the RFID collection point.

[0030] For example, if the RFID collection point is deployed between intersection A and intersection C, the line distance from intersection A to intersection C is S, and the travel speed is V, then $t = S/V$.

[0031] Step 203: According to the information about the time when the RFID collection point detects the RFID information of the vehicle and the travel time, calculate time at which the vehicle passes by the NVS camera.

[0032] It is assumed that: the time at which the vehicle passes by the RFID collection point is T1, the travel time is t, and the time at which the vehicle passes by the NVS camera is T2. Then $T2 = T1 + t$.

[0033] Step 204: Determine a start time and an end time of the video record according to the time at which the vehicle passes by the NVS camera and a video record duration set by the VMS, and intercept the video record in the video records recorded by the NVS camera. Corresponding video record information is obtained by invoking an NVS video record positioning interface according to the identification of the NVS camera and the start time and the end time of the video record, and the video record information is combined with the track information of the vehicle.

[0034] Determining the start time and the end time of the video record according to the time of the video record and the video record duration set by the VMS is based on the prior art, and is not further described.

[0035] A first embodiment of a vehicle management system VMS is shown in FIG. 3.

[0036] The VMS includes a vehicle information recording module 301, a geographical query range determining module 302, an information combining module 303, a camera selecting module 304, and a video record intercepting module 305.

[0037] The vehicle information recording module 301 is configured to receive information that is provided by a radio frequency identification RFID collection point and includes RFID information of a vehicle, determine that the RFID information of the vehicle meets a preset condition, and record the information provided by the RFID collection point, where the information provided by the RFID collection point includes geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and the RFID information of

the vehicle.

[0038] The geographical query range determining module 302 is configured to determine a geographical query range according to geographical position information of the RFID collection point. The determining manner is described in the embodiment of the method illustrated in FIG. 1, and is not further described.

[0039] The camera selecting module 304 is configured to select a network video surveillance system NVS camera in the geographical query range according to the determined geographical query range. The selection manner is described in the embodiment of the method illustrated in FIG. 1, and is not further described.

[0040] The video record intercepting module 305 is configured to intercept, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera.

[0041] The information combining module 303 is configured to combine the information provided by the RFID collection point and the intercepted video record.

[0042] Further, the geographical position information includes latitude and longitude information and a map vector direction.

[0043] Further, the geographical query range determining module 302 is specifically configured to calculate a latitude and longitude range by using the latitude and longitude of the RFID collection point as a center and using a set distance as a radius, and use the calculated latitude and longitude range as the geographical query range.

[0044] Further, the camera selecting module 304 is specifically configured to obtain latitude and longitude information and directions of each NVS camera in the geographical query range, and select, according to geographical information of urban roads and the vector direction of the RFID collection point, an NVS camera that matches the RFID collection point.

[0045] Further, as shown in FIG. 4, the information provided by the RFID collection point further includes vehicle speed information detected by the RFID collection point, and the video record intercepting module 305 includes a line distance calculating submodule 3051, a time calculating submodule 3052, and an intercepting submodule 3053.

[0046] The line distance calculating submodule 3051 is configured to calculate a line distance between the selected NVS camera and the RFID collection point according to the latitude and longitude information of the selected NVS camera and the RFID collection point and geographical information of urban roads; the time calculating submodule 3052 is configured to calculate travel time of the vehicle over the line distance according to the vehicle speed information detected by the RFID collection point and the line distance between the selected NVS camera and the RFID collection point, and calculate, according to the information about the time when the RFID

collection point detects the RFID information of the vehicle and the travel time, time at which the vehicle passes by the NVS camera; and the intercepting submodule 3053 is configured to determine a start time and an end time of the video record according to the time at which the vehicle passes by the NVS camera and a set video record duration, and intercept, according to the start time and the end time, the video record in the video records recorded by the NVS camera.

[0047] In the foregoing embodiments, the VMS may be a hardware device such as a computer, while the method performing the foregoing functions may be a processor of the computer, and the foregoing functional modules may also be modules in the processor of the computer.

[0048] Those skilled in the art should understand that the division of modules of the apparatus provided in the embodiments is division of functions and an actual structure may be the division or combination of the foregoing functional modules.

[0049] Persons of ordinary skill in the art may understand that all or a part of the steps of the methods in the embodiments may be implemented by a program instructing relevant hardware. The program may be stored in a computer readable storage medium.

[0050] The foregoing description is merely about the specific embodiments of the present invention, but is not intended to limit the protection scope of the present invention. Any variation or replacement readily figured out by persons skilled in the art within the technical scope disclosed in the present invention shall fall within the protection scope of the present invention. Therefore, the protection scope of the present invention shall be subject to the protection scope of the claims.

Claims

1. A vehicle surveillance method, comprising:

receiving information that is provided by a radio frequency identification RFID collection point and comprises RFID information of a vehicle, determining that the RFID information of the vehicle meets a preset condition, and recording the information provided by the RFID collection point sending the RFID information of the vehicle, wherein the information provided by the RFID collection point comprises geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and the RFID information of the vehicle; determining a geographical query range according to the geographical position information of the RFID collection point; selecting a network video surveillance NVS camera in the geographical query range accord-

ing to the determined geographical query range; intercepting, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera; and

combining the information provided by the RFID collection point and the intercepted video record.

2. The method according to claim 1, wherein the geographical position information of the RFID collection point comprises latitude and longitude information of the RFID collection point and a vector direction of the RFID collection point.

3. The method according to claim 2, wherein the determining a geographical query range according to the geographical position information of the RFID collection point comprises:

calculating a latitude and longitude range by using the latitude and longitude of the RFID collection point as a center and using a set distance as a radius, and using the calculated latitude and longitude range as a geographical query range.

4. The method according to claim 2 or 3, wherein the selecting an NVS camera in the geographical query range according to the determined geographical query range comprises:

obtaining latitude and longitude information and directions of each NVS camera in the geographical query range, and selecting, according to geographical information of urban roads and the vector direction of the RFID collection point, an NVS camera that matches the RFID collection point.

5. The method according to claim 2, wherein the information provided by the RFID collection point further comprises vehicle speed information detected by the RFID collection point and the intercepting, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera comprises:

calculating a line distance between the selected NVS camera and the RFID collection point according to latitude and longitude information of the selected NVS camera and the RFID collection point and geographical information of urban roads;

calculating travel time of the vehicle over the line distance according to the vehicle speed information detected by the RFID collection point and the line distance between the selected NVS camera the RFID collection point;

calculating, according to the information about the time when the RFID collection point detects the RFID information of the vehicle and the travel time, time at which the vehicle passes by the NVS camera; and

determining a start time segment and an end time segment of the video record according to the time at which the vehicle passes by the NVS camera and a video record duration, and intercepting, according to the start time segment and the end time segment, the video record in the video records recorded by the NVS camera.

6. A vehicle management system VMS, comprising a vehicle information recording module, a geographical query range determining module, an information combining module, a camera selecting module, and a video record intercepting module, wherein:

the vehicle information recording module is configured to receive information that is provided by a radio frequency identification RFID collection point and comprises RFID information of a vehicle, determine that the RFID information of the vehicle meets a preset condition, and record the information provided by the RFID collection point, wherein the information provided by the RFID collection point comprises geographical position information of the RFID collection point, information about time when the RFID collection point detects the RFID information of the vehicle, and the RFID information of the vehicle;

the geographical query range determining module is configured to determine a geographical query range according to the geographical position information of the RFID collection point; the camera selecting module is configured to select a network video surveillance NVS camera in the geographical query range according to the determined geographical query range;

the video record intercepting module is configured to intercept, according to the recorded information about the time when the RFID collection point detects the RFID information of the vehicle, a video record corresponding to the RFID information in video records recorded by the selected NVS camera; and

the information combining module is configured to combine the information provided by the RFID collection point and the intercepted video record.

7. The system according to claim 6, wherein the geo-

graphical position information of the RFID collection point comprises latitude and longitude information of the RFID collection point and a vector direction of the RFID collection point.

8. The system according to claim 7, wherein the geographical query range determining module is specifically configured to calculate a latitude and longitude range by using the latitude and longitude of the RFID collection point as a center and using a set distance as a radius, and use the calculated latitude and longitude range as a geographical query range.

9. The system according to claim 7 or 8, wherein the camera selecting module is specifically configured to obtain latitude and longitude information and directions of each NVS camera in the geographical query range, and select, according to geographical information of urban roads and the vector direction of the RFID collection point, an NVS camera that matches the RFID collection point.

10. The system according to claim 7, wherein the information provided by the RFID collection point further comprises vehicle speed information detected by the RFID collection point and the video record intercepting module comprises a line distance calculating submodule, a time calculating submodule, and an intercepting submodule, wherein:

the line distance calculating submodule is configured to calculate a line distance between the selected NVS camera and the RFID collection point according to latitude and longitude information of the selected NVS camera and the RFID collection point and geographical information of urban roads;

the time calculating submodule is configured to calculate travel time of the vehicle over the line distance according to the vehicle speed information detected by the RFID collection point and the line distance between the selected NVS camera and the RFID collection point, and calculate, according to the information about the time when the RFID collection point detects the RFID information of the vehicle and the travel time, time at which the vehicle passes by the NVS camera; and

the intercepting submodule is configured to determine a start time segment and an end time segment of the video record according to the time at which the vehicle passes by the NVS camera and a set video record duration, and intercept, according to the start time segment and the end time segment, the video record in the video records recorded by the NVS camera.

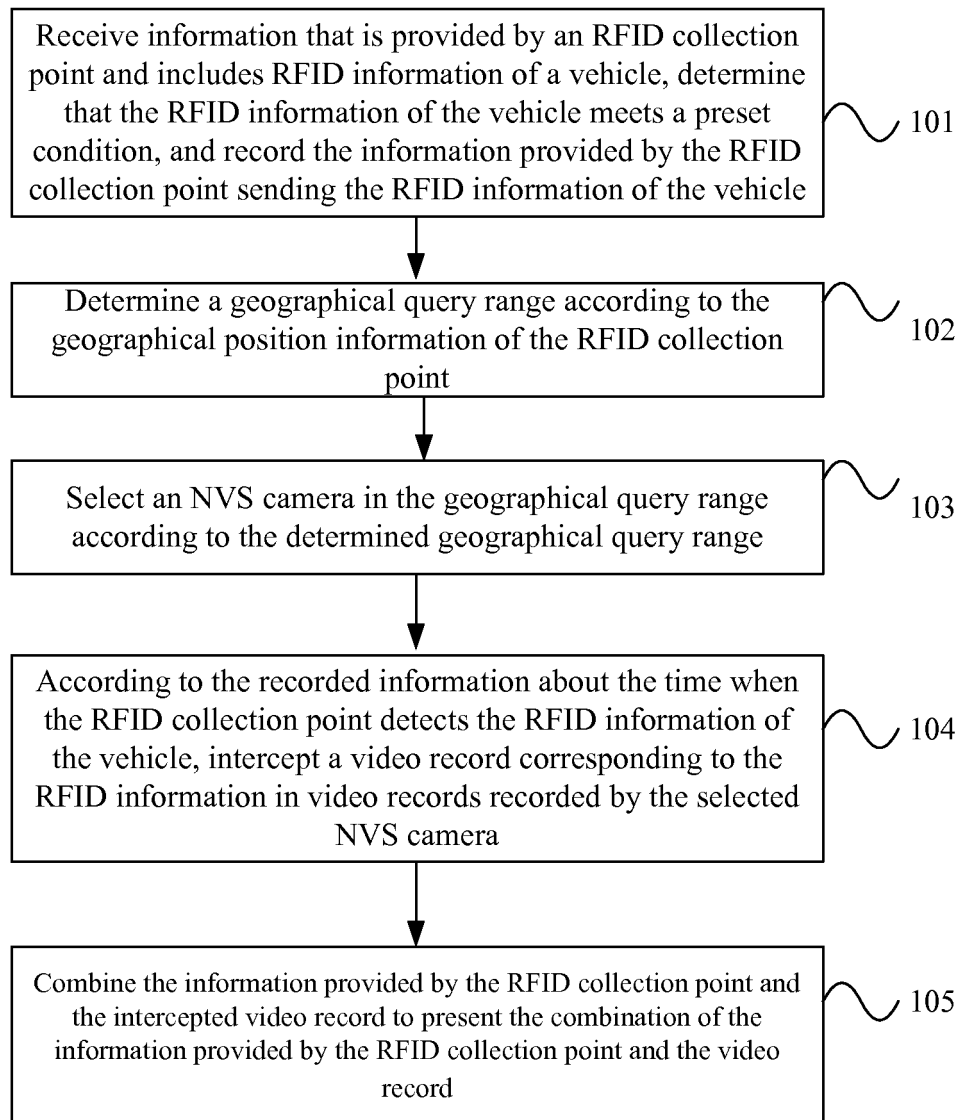


FIG. 1

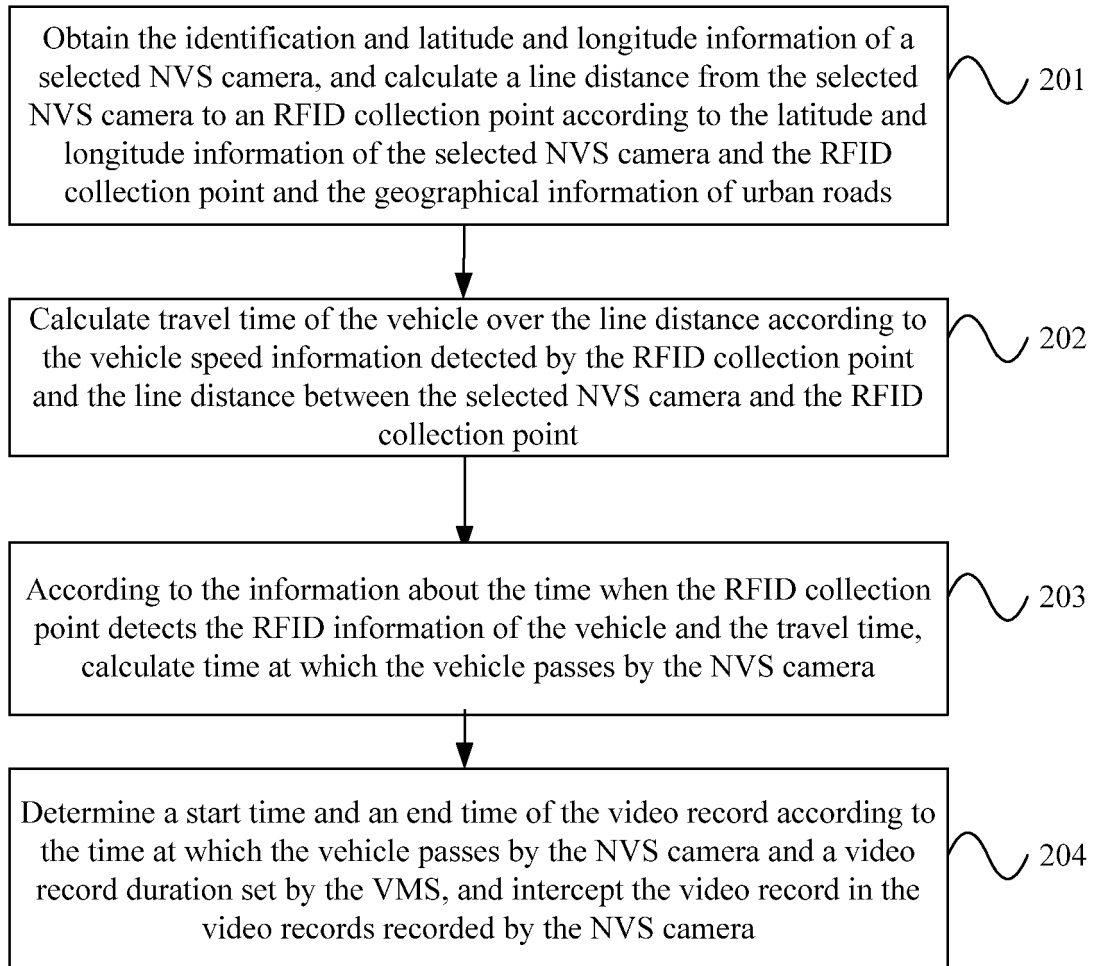


FIG. 2

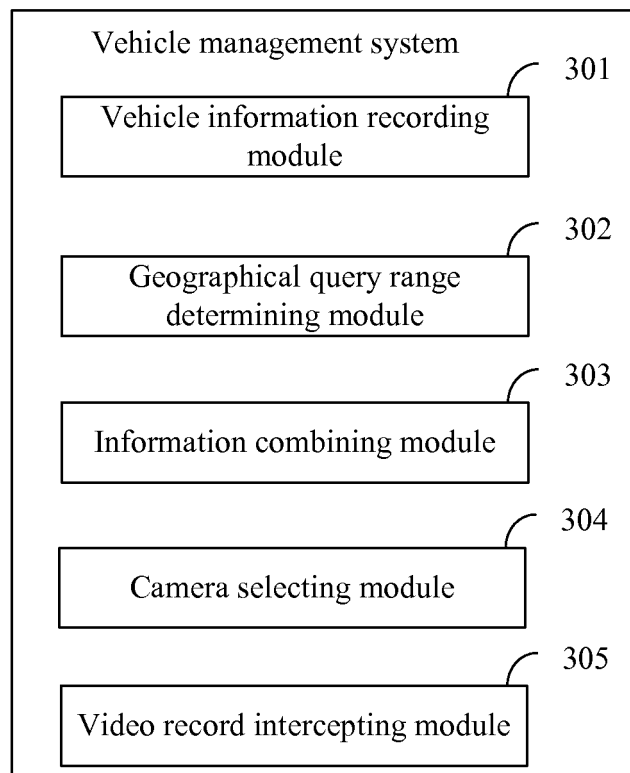


FIG. 3

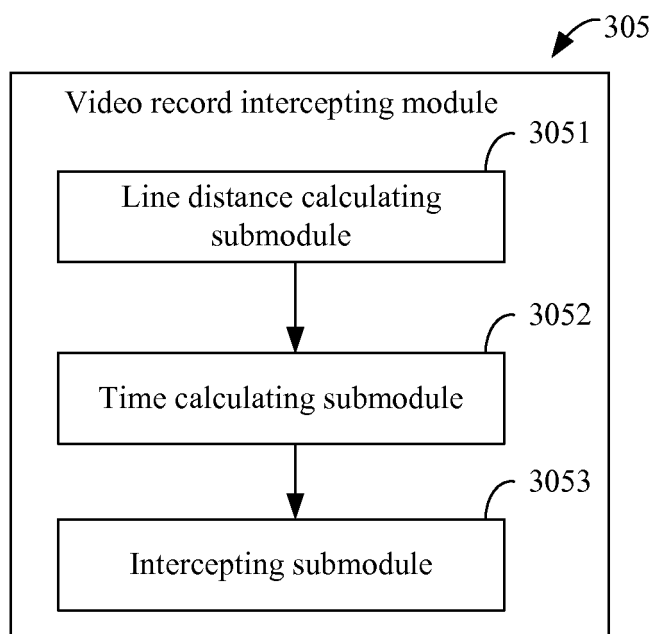


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/076184

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G08G1, H04N7

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS,CNTEXT,CNKI,VEN,WOTXT,EPTXT,USTXT: vehicle, car, monitor+, track+ (radio 1w frequency), camera , video, position+, loca+, place, station, suspect, blacklist

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN102426782A (HUAWEI TECHNOLOGIES CO., LTD), 25 Apr.2012(25.04.2012), claims 1-10	1-10
A	CN101110160A (UNIV. TIANJIN), 23 Jan.2008 (23.01.2008), description, page 2, line 2 to page4, last line, and fig. 1	1-10
A	CN201374122Y (SHENZHEN SEG CO., LTD), 30 Dec. 2009 (30.12.2009), the whole document	1-10
A	US2010/0148937A1 (HOWARD B), 17 Jun. 2010(17.06.2010), the whole document	1-10
A	KR10-0679495B1 (LEE K C), 07 Feb.2007(07.02.2007), the whole document	1-10

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

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“P” document published prior to the international filing date but later than the priority date claimed

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“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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“&”document member of the same patent family

Date of the actual completion of the international search

03 Aug. 2012(03.08.2012)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT
Information on patent family members

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Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/076184

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A. CLASSIFICATION OF SUBJECT MATTER

G08G1/01 (2006.01) i

H04N7/18 (2006.01) i

REFERENCES CITED IN THE DESCRIPTION

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