SUMMARY

The technique disclosed in above-referenced Japanese Patent Laying-Open No. 2015-111906 conducts a search using cameras installed across a large area. Based on positional information about a camera transmitted together with image information captured by the camera, the identified search target is located. As for the moving cameras mounted on movable bodies such as vehicles, however, the movable body may go out of an area to be searched, resulting in the possibility that the search system loses sight of the search target during the search or becomes unable to search for the target.

The present disclosure is given to provide solutions to the above problems. Embodiments of the present disclosure efficiently search for a person to be protected (hereinafter referred to as "protection target"), by a system for identifying the protection target based on information from a detection device mounted on a movable body, so as to rescue the protection target.

A rescue system according to a first aspect of the present disclosure is a rescue system for identifying and rescuing a protection target, using information from a detection device. The rescue system includes: a plurality of movable bodies each equipped with the detection device; and a server configured to communicate with the plurality of movable bodies. The server is configured to (a) define a search area to be searched for the protection target, (b) acquire positional information about the plurality of movable bodies and select, from movable bodies located within the search area, at least one movable body to be used for searching for the protection target, the movable body being selected as a selected movable body, and (c) output, to the selected movable body, a search command for searching for the protection target, wherein the server is configured to enable to change the selected movable body used for searching, when the selected movable body goes out from the search area or a new movable body enters the search area.

When the rescue system in the present disclosure searches for a protection target, the server first defines a search area to be searched for the protection target, selects a movable body from movable bodies (vehicles, for example) located within the defined search area, so as to use the selected movable body for collecting information for the search. A command to search is then output to the selected movable body. In this way, the search for the protection target is conducted based on information from

protection level is determined in accordance with at least one of a location where the protection target is detected, a time when the protection target is detected, weather when the protection target is detected, and a condition of the protection target when the protection target is detected.

When a location where the protection target is detected is out of a predetermined range, the server makes the rescue request to the rescue group.

When the server makes the rescue request to the rescue group, the server provides the rescue group with a notification of positional information about the protection target. In response to the rescue request from the server, the rescue group dispatches a person in charge to a location indicated by the positional information.

When the requester makes a request to rescue after receiving the notification, the server makes a rescue request, to a rescue group, to rescue the protection target.

In the system configured in this way, it is determined whether to make a rescue request to the rescue group, in accordance with the protection level determined in accordance with the environment of the protection target and the condition of the protection target when the protection target is found, and a request from the requester. In some cases, the identified protection target may perform an ordinary activity such as walking or shopping, and such a protection target requires no rescue. Whether to make a rescue request to a rescue group is determined in accordance with the protection level which is determined based on detected information. Accordingly, unnecessary requests to rescue can be suppressed.

A server according to a second aspect of the present disclosure is a server used for a rescue system for identifying and rescuing a protection target, using information from a detection device. The server is configured to communicate with a plurality of movable bodies each equipped with the detection device. The server is further configured to (a) define a search area to be searched for the protection target, (b) acquire positional information about the plurality of movable bodies and select, from movable bodies located within the search area, at least one movable body to be used for searching for the protection target, the movable body being selected as a selected movable body, (c) output, to the selected movable body, a search command for searching for the protection target, and (d) enable to change the selected movable body used for searching, when the selected movable body goes out from the search area or a new movable body enters the search area.

A method according to a third aspect of the present disclosure is a rescue method for identifying and rescuing a protection target, using information from a detection device in a system, the system including: a plurality of movable bodies each equipped with the detection device; and a server configured to communicate with the plurality of movable bodies. The method includes, by the server: (a) defining a search area to be searched for the protection target; (b) acquiring positional information about the plurality of movable bodies; (c) selecting, from movable bodies located within the search area, at least one movable body to be used for searching for the protection target, the movable body being selected as a selected movable body; (d) outputting, to the selected movable body, a search command for searching for the protection target; and (e) enabling to change the selected movable body used for searching, when the selected movable body goes out from the search area or a new movable body enters the search area.

The foregoing and other embodiments, features, aspects and advantages of the present disclosure will become more apparent from the following detailed description of the present disclosure when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram of an overall configuration of a rescue system according to the present embodiment.

Fig. 2 is a block diagram for illustrating details of a vehicle and a server in Fig. 1.

Fig. 3 is a flowchart for illustrating details of control executed by a vehicle and a server for a rescue system according to a first embodiment.

Fig. 4 is a flowchart for illustrating details of control executed by a vehicle and a server for a rescue system according to a second embodiment.

Fig. 5 is a flowchart for illustrating details of control executed by a vehicle and a server for a rescue system according to a third embodiment.

Fig. 6 is a flowchart for illustrating details of control executed by a vehicle and a server for a rescue system according to a fourth embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following, embodiments of the present disclosure are described in detail with reference to the drawings. In the drawings, the same or corresponding elements

CLAIMS

1. A rescue system (10) for identifying and rescuing a protection target, using information from a detection device (110, 120), the rescue system (10) comprising:

a plurality of movable bodies (100) each equipped with the detection device (110, 120); and

a server (200) configured to communicate with the plurality of movable bodies (100),

the server (200) being configured to

define a search area to be searched for the protection target,

acquire positional information about the plurality of movable bodies (100) and select, from movable bodies located within the search area, at least one movable body to be used for searching for the protection target, the movable body being selected as a selected movable body (100), and

output, to the selected movable body (100), a search command for searching for the protection target, wherein

the server (200) is configured to enable to change the selected movable body (100) used for searching, when the selected movable body (100) goes out from the search area or a new movable body enters the search area.

2. The rescue system according to claim 1, wherein

when receiving the search command, the selected movable body (100) is configured to transmit to the server (200) information acquired from the detection device (110, 120), and

the server (200) is configured to identify the protection target, based on the information transmitted from the selected movable body (100).

3. The rescue system according to claim 2, wherein

the detection device is a camera (110), and

the server (200) is configured to identify the protection target, using an image captured by the camera (110) and transmitted from the selected movable body (100).

4. The rescue system according to claim 3, wherein

the server (200) is configured to identify, using a characteristic of a candidate included in the image captured by the camera (110), the candidate as the protection target, and

the characteristic includes text information about the candidate, and clothing, belonging, and behavioral pattern of the candidate.

5. The rescue system according to claim 2, wherein

the protection target has a belonging with ID information,

the detection device is a sensor (120) configured to read the ID information, and

the server (200) is configured to identify the protection target using the ID information transmitted from the selected movable body (100).

6. The rescue system according to claim 1, wherein

the server (200) is configured to transmit to the selected movable body (100) information for identifying the protection target, and

the selected movable body (100) is configured to compare information acquired from the detection device (110, 120) with the information transmitted from the server (200) to identify the protection target, and transmit, to the server (200), detection information of the protection target.

7. The rescue system according to any one of claims 2 to 6, wherein

search for the protection target is performed in response to a request from a requester, and

when the protection target is identified, the server (200) is configured to provide the requester with a notification that the protection target has been found.

8. The rescue system according to any one of claims 2 to 7, wherein

when the protection target is identified, the server (200) is configured to output, to the selected movable body (100), a command to watch the protection target.

9. The rescue system according to any one of claims 2 to 8, wherein

when the protection target is identified based on information obtained from the selected movable body (100), the server (200) is configured to output, to a rescue group, a request signal to rescue the protection target.

10. The rescue system according to claim 9, wherein

the server (200) is configured to determine a protection level for the protection target, using information from the selected movable body (100),

when the protection level is larger than a threshold value, the server (200) is configured to output the request signal to the rescue group, and

the protection level is determined in accordance with at least one of a location where the protection target is detected, a time when the protection target is detected, weather when the protection target is detected, and a condition of the protection target when the protection target is detected.

11. The rescue system according to claim 9, wherein

when a location where the protection target is detected is out of a predetermined range, the server (200) is configured to output the request signal to the rescue group.

12. The rescue system according to claim 9, wherein

when the server (200) outputs the request signal to the rescue group, the server (200) is configured to provide the rescue group with a notification of positional information about the protection target, and output, to the rescue group, a signal instructing to dispatch a person in charge to a location indicated by the positional information.

13. The rescue system according to claim 7, wherein

in response to a rescue request from the requester after providing the requester with the notification, the server (200) is configured to output the request signal to the rescue group.

14. A server (200) used for a rescue system (10) for identifying and rescuing a protection target, using information from a detection device,

the server (200) being configured to communicate with a plurality of movable bodies (100) each equipped with the detection device (110, 120),

the server (200) being configured to

define a search area to be searched for the protection target,

acquire positional information about the plurality of movable bodies (100) and select, from movable bodies located within the search area, at least one movable body to be used for searching for the protection target, the movable body being selected as a selected movable body (100),

output, to the selected movable body (100), a search command for searching for the protection target, and

enable to change the selected movable body (100) used for searching, when the selected movable body (100) goes out from the search area or a new movable body enters the search area.

15. A rescue method for identifying and rescuing a protection target, using information from a detection device (110, 120) in a system (10),

the system comprising:

a plurality of movable bodies (100) each equipped with the detection device (110, 120); and

a server (200) configured to communicate with the plurality of movable bodies (100),

the rescue method comprising, by the server (200):

defining a search area to be searched for the protection target;

acquiring positional information about the plurality of movable bodies (100);

selecting, from movable bodies located within the search area, at least one movable body to be used for searching for the protection target, the movable body being selected as a selected movable body (100);

outputting, to the selected movable body (100), a search command for searching for the protection target, and

enabling to change the selected movable body used for searching, when the selected movable body goes out from the search area or a new movable body enters the search area.