# CLAIMS

[Claim 1]

A movement path specification device comprising:

a movement path output unit configured to output identification information of a road included in any estimated movement path information other than that determined to be outside a movement path among the estimated movement path information including the identification information of the road representing the movement path of past estimation as the identification information of the road representing an established past movement path.

[Claim 2]

The movement path specification device according to claim 1, wherein the movement path output unit specifies the identification information of a continuously included common road as the established past movement path within the estimated movement path information other than that determined to be outside the movement path, and outputs the identification information of the road representing the past movement path.

[Claim 3]

The movement path specification device according to claim 1 or 2, comprising:

a road information specification unit configured to specify road information at a location within an error range from a current location of its own device as a candidate for a current movement path;

an estimated movement location computation unit configured to sequentially compute estimated movement locations from one endpoint closest to the current location on each road of a candidate for the current movement path specified by the road information specification unit according to passage of time based on a movement

distance of a vehicle including its own device according to the passage of time;

a next path road information specification unit configured to specify the road information in which the estimated movement location computed for the road information specified by the road information specification unit first approaches another endpoint of the road information and specify the road information connected to the road represented by the road information as the candidate for the next path;

an estimated movement path information generation unit configured to specify the road information connected to the road information specified by the next path road information specification unit as the candidate for the next path from among the road information specified by the road information specification unit as the candidate for a current movement path and separately generate the estimated movement path information in which the identification information of the road included in the road information and the identification information of the road included in the road information specified by the next path road information specification unit as the candidate for the next path are associated for all the road information specified by the next path road information specification unit as the candidate for the next path; and

an out-of-movement-path determination unit configured to determine the estimated movement path information in which possibility of the candidate for the movement path is low among generated estimated movement path information as the estimated movement path information outside the movement path by setting the road information specified by the next path road information specification unit as the candidate for the next path as the candidate for the current movement path and sequentially performing processes of the estimated movement location computation unit, the next path road information specification unit, and the estimated movement path information generation unit.

[Claim 4]

The movement path specification device according to claim 3,

wherein the estimated movement path information generation unit computes estimated likelihood of the road information specified as the candidate for a current movement path using at least a location and an extending direction in a real space of the road included in the road information specified as the candidate for the current movement path and the location and a traveling direction in the real space detected by its own device, and associates and records the computed estimated likelihood and the identification information of the road included in the road information specified as the candidate for the current movement path in the estimated movement path information, and

wherein the movement path output unit specifies one piece of the estimated movement path information based on the estimated likelihood from among the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

[Claim 5]

The movement path specification device according to claim 4, wherein the movement path output unit specifies the estimated movement path information in which the estimated likelihood having a highest value is recorded among the estimated likelihood recorded in association with the identification information of recently specified roads included in the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

[Claim 6]

The movement path specification device according to any of claims 1 to 3, wherein the movement path output unit specifies the estimated movement path information in which the identification information of the road input from another device is recorded as the identification information of a recently specified road among the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

[Claim 7]

The movement path specification device according to claim 4, wherein the movement path output unit specifies the estimated movement path information recording estimated likelihood having a highest value among the estimated likelihood recorded in association with the identification information of the road included in the road information specified as the candidate for the current movement path a predetermined number of times earlier among the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

[Claim 8]

The movement path specification device according to any one of claims 1 to 7, wherein, after the identification information of roads specified as the established past movement path is output, the movement path output unit determines to compute the output of the identification information of the road representing the established past movement path again when the identification information of the road recorded in most

recently estimated movement path information among the output road identification information is not consistent with the identification information of a connection road recorded in association with location information close to a current location among the identification information of connection roads included in newly specified road information.

[Claim 9]

A processing method of a movement path specification device, comprising:

outputting, by a movement path output unit of the movement path specification device, identification information of a road included in any estimated movement path information other than that determined to be outside a movement path among the estimated movement path information including the identification information of the road representing the movement path of past estimation as the identification information of the road representing an established past movement path.

[Claim 10]

The processing method according to claim 9, wherein the movement path output unit specifies the identification information of a continuously included common road as the established past movement path within the estimated movement path information other than that determined to be outside the movement path, and outputs the identification information of the road representing the past movement path.

[Claim 11]

The processing method according to claim 9 or 10, comprising:

specifying, by a road information specification unit of the movement path specification device, road information at a location within an error range from a current location of its own device as a candidate for a current movement path;

sequentially computing, by an estimated movement location computation unit of

the movement path specification device, estimated movement locations from one endpoint closest to the current location on each road of the candidate for the current movement path specified by the road information specification unit according to passage of time based on a movement distance of a vehicle including its own device according to the passage of time;

specifying, by a next path road information specification unit of the movement path specification device, the road information in which the estimated movement location computed for the road information specified by the road information specification unit first approaches another endpoint of the road information and specifying the road information connected to the road represented by the road information as the candidate for the next path;

specifying, by an estimated movement path information generation unit of the movement path specification device, the road information connected to the road information specified by the next path road information specification unit as the candidate for the next path from among the road information specified by the road information specification unit as the candidate for a current movement path and separately generating the estimated movement path information in which the identification information of the road included in the road information and the identification information of the road included in the road information specified by the next path road information specification unit as the candidate for the next path are associated for all the road information specified by the next path road information specification unit as the candidate for the next path; and

determining, by an out-of-movement-path determination unit of the movement path specification device, the estimated movement path information in which possibility of the candidate for the movement path is low among generated estimated movement

path information as the estimated movement path information outside the movement path by setting the road information specified by the next path road information specification unit as the candidate for the next path as the candidate for the current movement path and sequentially performing processes of the estimated movement location computation unit, the next path road information specification unit, and the estimated movement path information generation unit.

[Claim 12]

A program for causing a computer of a movement path specification device to function as:

a movement path output means configured to output identification information of a road included in any estimated movement path information other than that determined to be outside a movement path among the estimated movement path information including the identification information of the road representing the movement path of past estimation as the identification information of the road representing an established past movement path.

[Claim 13]

The program according to claim 12, wherein the movement path output means specifies the identification information of a continuously included common road as the established past movement path within the estimated movement path information other than that determined to be outside the movement path, and outputs the identification information of the road representing the past movement path.

[Claim 14]

The program according to claim 12 or 13, wherein the program causes the computer to further function as:

a road information specification means configured to specify road information at

a location within an error range from a current location of its own device as a candidate for a current movement path;

an estimated movement location computation means configured to sequentially compute estimated movement locations from one endpoint closest to the current location on each road of a candidate for the current movement path specified by the road information specification means according to passage of time based on a movement distance of a vehicle including its own device according to the passage of time;

a next path road information specification means configured to specify the road information in which the estimated movement location computed for the road information specified by the road information specification means first approaches another endpoint of the road information and specify the road information connected to the road represented by the road information as the candidate for the next path;

an estimated movement path information generation means configured to specify the road information connected to the road information specified by the next path road information specification means as the candidate for the next path from among the road information specified by the road information specification means as the candidate for a current movement path and separately generate the estimated movement path information in which the identification information of the road included in the road information and the identification information of the road included in the road information specified by the next path road information specification means as the candidate for the next path are associated for all the road information specified by the next path road information specification means as the candidate for the next path; and

an out-of-movement-path determination means configured to determine the estimated movement path information in which possibility of the candidate for the movement path is low among generated estimated movement path information as the

estimated movement path information outside the movement path by setting the road information specified by the next path road information specification means as the candidate for the next path as the candidate for the current movement path and sequentially performing processes of the estimated movement location computation means, the next path road information specification means, and the estimated movement path information generation means.

# CLAIMS

1. A movement path specification device comprising:
a movement path output unit configured to output identification information of a road included in any estimated movement path information other than that determined to be outside a movement path among the estimated movement path information including the identification information of the road representing the movement path of past estimation as the identification information of the road representing an established past movement path, wherein the movement path output unit specifies the identification information of a continuously included common road as the established past movement path within the estimated movement path information other than that determined to be outside the movement path, and outputs the identification information of the road representing the past movement path.

2. The movement path specification device according to claim 1, comprising:

a road information specification unit configured to specify road information at a location within an error range from a current location of its own device as a candidate for a current movement path;

an estimated movement location computation unit configured to sequentially compute estimated movement locations from one endpoint closest to the current location on each road of a candidate for the current movement path specified by the road information specification unit according to passage of time based on a movement distance of a vehicle including its own device according to the passage of time;

a next path road information specification unit configured to specify the road information in which the estimated movement location computed for the road information specified by the road information specification unit first approaches another endpoint of the road information and specify the road information connected to the road represented by the road information as the

candidate for the next path;

an estimated movement path information generation unit configured to specify the road information connected to the road information specified by the next path road information specification unit as the candidate for the next path from among the road information specified by the road information specification unit as the candidate for a current movement path and separately generate the estimated movement path information in which the identification information of the road included in the road information and the identification information of the road included in the road information specified by the next path road information specification unit as the candidate for the next path are associated for all the road information specified by the next path road information specification unit as the candidate for the next path; and

an out-of-movement-path determination unit configured to determine the estimated movement path information in which possibility of the candidate for the movement path is low among generated estimated movement path information as the estimated movement path information outside the movement path by setting the road information specified by the next path road information specification unit as the candidate for the next path as the candidate for the current movement path and sequentially performing processes of the estimated movement location computation unit, the next path road information specification unit, and the estimated movement path information generation unit.

3. The movement path specification device according to claim 2,

wherein the estimated movement path information generation unit computes estimated likelihood of the road information specified as the candidate for a current movement path using at least a location and an extending direction in a real space of the road included in the road information specified as the candidate for the current movement path and the location and a traveling direction in the real space detected by its own device, and associates and records the computed estimated likelihood and the identification information of the road

included in the road information specified as the candidate for the current movement path in the estimated movement path information, and

wherein the movement path output unit specifies one piece of the estimated movement path information based on the estimated likelihood from among the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

4. The movement path specification device according to claim 3, wherein the movement path output unit specifies the estimated movement path information in which the estimated likelihood having a highest value is recorded among the estimated likelihood recorded in association with the identification information of recently specified roads included in the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

5. The movement path specification device according to claim 1 or 2, wherein the movement path output unit specifies the estimated movement path information in which the identification information of the road input from another device is recorded as the identification information of a recently specified road among the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

6. The movement path specification device according to claim 3, wherein the movement path output unit specifies the estimated movement path information recording estimated likelihood having a highest value among the

estimated likelihood recorded in association with the identification information of the road included in the road information specified as the candidate for the current movement path a predetermined number of times earlier among the estimated movement path information other than that determined to be outside the movement path, and specifies and outputs the identification information of each road included in the estimated movement path information as the established past movement path.

7. The movement path specification device according to any one of claims 1 to 6, wherein, after the identification information of roads specified as the established past movement path is output, the movement path output unit determines to compute the output of the identification information of the road representing the established past movement path again when the identification information of the road recorded in most recently estimated movement path information among the output road identification information is not consistent with the identification information of a connection road recorded in association with location information close to a current location among the identification information of connection roads included in newly specified road information.

8. A processing method of a movement path specification device, comprising:

outputting, by a movement path output unit of the movement path specification device, identification information of a road included in any estimated movement path information other than that determined to be outside a movement path among the estimated movement path information including the identification information of the road representing the movement path of past estimation as the identification information of the road representing an established past movement path, wherein the movement path output unit specifies the identification information of a continuously included common road as the established past movement path within the estimated movement path

information other than that determined to be outside the movement path, and outputs the identification information of the road representing the past movement path.

9. The processing method according to claim 8, comprising:

specifying, by a road information specification unit of the movement path specification device, road information at a location within an error range from a current location of its own device as a candidate for a current movement path;

sequentially computing, by an estimated movement location computation unit of the movement path specification device, estimated movement locations from one endpoint closest to the current location on each road of the candidate for the current movement path specified by the road information specification unit according to passage of time based on a movement distance of a vehicle including its own device according to the passage of time;

specifying, by a next path road information specification unit of the movement path specification device, the road information in which the estimated movement location computed for the road information specified by the road information specification unit first approaches another endpoint of the road information and specifying the road information connected to the road represented by the road information as the candidate for the next path;

specifying, by an estimated movement path information generation unit of the movement path specification device, the road information connected to the road information specified by the next path road information specification unit as the candidate for the next path from among the road information specified by the road information specification unit as the candidate for a current movement path and separately generating the estimated movement path information in which the identification information of the road included in the road information and the identification information of the road included in the

road information specified by the next path road information specification unit as the candidate for the next path are associated for all the road information specified by the next path road information specification unit as the candidate for the next path; and

determining, by an out-of-movement-path determination unit of the movement path specification device, the estimated movement path information in which possibility of the candidate for the movement path is low among generated estimated movement path information as the estimated movement path information outside the movement path by setting the road information specified by the next path road information specification unit as the candidate for the next path as the candidate for the current movement path and sequentially performing processes of the estimated movement location computation unit, the next path road information specification unit, and the estimated movement path information generation unit.

10. A program for causing a computer of a movement path specification device to function as:

a movement path output means configured to output identification information of a road included in any estimated movement path information other than that determined to be outside a movement path among the estimated movement path information including the identification information of the road representing the movement path of past estimation as the identification information of the road representing an established past movement path, wherein the movement path output means specifies the identification information of a continuously included common road as the established past movement path within the estimated movement path information other than that determined to be outside the movement path, and outputs the identification information of the road representing the past movement path.

11. The program according to claim 10, wherein the program causes the

computer to further function as:

a road information specification means configured to specify road information at a location within an error range from a current location of its own device as a candidate for a current movement path;

an estimated movement location computation means configured to sequentially compute estimated movement locations from one endpoint closest to the current location on each road of a candidate for the current movement path specified by the road information specification means according to passage of time based on a movement distance of a vehicle including its own device according to the passage of time;

a next path road information specification means configured to specify the road information in which the estimated movement location computed for the road information specified by the road information specification means first approaches another endpoint of the road information and specify the road information connected to the road represented by the road information as the candidate for the next path;

an estimated movement path information generation means configured to specify the road information connected to the road information specified by the next path road information specification means as the candidate for the next path from among the road information specified by the road information specification means as the candidate for a current movement path and separately generate the estimated movement path information in which the identification information of the road included in the road information and the identification information of the road included in the road information specified by the next path road information specification means as the candidate for the next path are associated for all the road information specified by the next path road information specification means as the candidate for the next path; and

an out-of-movement-path determination means configured to determine the estimated movement path information in which possibility of the candidate for the movement path is low among generated estimated movement path

information as the estimated movement path information outside the movement path by setting the road information specified by the next path road information specification means as the candidate for the next path as the candidate for the current movement path and sequentially performing processes of the estimated movement location computation means, the next path road information specification means, and the estimated movement path information generation means.