CLAIMS

1. A pose determination method, comprising:

acquiring a current first integration pose, first observation pose, and second observation pose of a vehicle;

performing integration pose interpolation when an integration moment of the first integration pose is different from a target observation moment, to obtain a second integration pose having an integration moment identical to the target observation moment, wherein the target observation moment is an observation moment that meets a preset requirement from a first observation moment of the first observation pose and a second observation moment of the second observation pose;

determining a target pose correction matrix according to the first observation pose, the second observation pose, the second integration pose, and a current pose correction matrix; and

obtaining a positioning pose of the vehicle based on the first integration pose and the target pose correction matrix.

2. The method of claim 1, wherein performing the integration pose interpolation when the integration moment of the first integration pose is different from the target observation moment, to obtain the second integration pose having the integration moment identical to the target observation moment, comprises:

when the integration moment of the first integration pose is later than the target observation moment, performing the integration pose interpolation to obtain the second integration pose having the integration moment identical to the target observation moment; or

when the integration moment of the first integration pose is earlier than the target observation moment, continuing to perform integration based on the first integration pose until the integration moment is greater than or equal to the target observation moment, and performing the integration pose interpolation to obtain the second integration pose having the integration moment identical to the target observation moment.

3. The method of claim 1 or 2, wherein determining the target pose correction matrix according to

the first observation pose, the second observation pose, the second integration pose, and the current pose correction matrix, comprises:

multiplying the second integration pose by the current pose correction matrix to obtain a predicted pose;

filtering the predicted pose, the first observation pose, and the second observation pose to obtain a filtered pose; and

calculating the target pose correction matrix based on the filtered pose and the second integration pose.

4. The method of claim 2 or 3, wherein performing the integration pose interpolation, comprises:

searching for two frames of historical integration poses, wherein integration moments of the two frames of historical integration poses are a moment immediately before the target observation moment and a moment immediately after the target observation moment, respectively; and

performing interpolation on the two frames of historical integration poses.

5. The method of any one of claims 1 to 4, wherein acquiring the current first integration pose, first observation pose, and second observation pose of the vehicle, comprises:

performing integration based on a wheel speed and an angular velocity of the vehicle, starting from an initial pose of the vehicle, to obtain the first integration pose, wherein the initial pose is a pose of the vehicle at startup;

obtaining the first observation pose based on global navigation satellite system (GNSS) positioning data of the vehicle; and

obtaining the second observation pose based on a visual sensor of the vehicle in combination with map data.

6. The method of claim 5, wherein obtaining the first observation pose based on the GNSS positioning data of the vehicle, comprises:

determining whether an absolute value of a difference between a first relative pose and a second relative pose is less than a preset threshold, wherein the first relative pose is a relative pose between two adjacent frames of observation poses provided by raw GNSS positioning data, and the second relative pose is a relative pose between two frames of integration poses at moments corresponding to the two adjacent frames of observation poses;

if the absolute value is less than the preset threshold, not adjusting a first covariance of the raw GNSS positioning data, and obtaining the first observation pose based on the raw GNSS positioning data; and

if the absolute value is greater than or equal to the preset threshold, adjusting the first covariance of the raw GNSS positioning data to a first target covariance to obtain the GNSS positioning data, and obtaining the first observation pose based on the GNSS positioning data.

7. The method of claim 5 or 6, wherein obtaining the second observation pose based on the visual sensor of the vehicle in combination with the map data, comprises:

collecting visual perception data based on the visual sensor, matching the visual perception data with the map data to obtain one or more matching pairs, and performing optimization processing on the one or more matching pairs to obtain a residual;

determining whether a number of the one or more matching pairs is greater than or equal to a first set value, and whether the residual is less than or equal to a second set value;

if the number of the one or more matching pairs is greater than or equal to the first set value and the residual is less than or equal to the second set value, not adjusting a second covariance, and obtaining the second observation pose based on the visual perception data, the map data, and the second covariance; and

if the number of the one or more matching pairs is less than the first set value or the residual is greater than the second set value, adjusting the second covariance to a second target covariance, and obtaining the second observation pose based on the visual perception data, the map data, and the second target covariance.

8. A pose determination apparatus, comprising:

an acquisition module, configured to acquire a current first integration pose, first observation pose, and second observation pose of a vehicle;

an interpolation module, configured to perform integration pose interpolation when an integration moment of the first integration pose is different from a target observation moment, to obtain a second integration pose having an integration moment identical to the target observation moment, wherein the target observation moment is an observation moment that meets a preset requirement from a first observation moment of the first observation pose and a second observation moment of the second observation pose;

a determination module, configured to determine a target pose correction matrix according to the first observation pose, the second observation pose, the second integration pose, and a current pose correction matrix; and

a positioning module, configured to obtain a positioning pose of the vehicle based on the first integration pose and the target pose correction matrix.

9. The apparatus of claim 8, wherein the interpolation module is configured to:

when the integration moment of the first integration pose is later than the target observation moment, perform the integration pose interpolation to obtain the second integration pose having the integration moment identical to the target observation moment; or

when the integration moment of the first integration pose is earlier than the target observation moment, continue to perform integration based on the first integration pose until the integration moment is greater than or equal to the target observation moment, and perform the integration pose interpolation to obtain the second integration pose having the integration moment identical to the target observation moment.

10. The apparatus of claim 8 or 9, wherein the determination module is configured to:

multiply the second integration pose by the current pose correction matrix to obtain a predicted pose;

filter the predicted pose, the first observation pose, and the second observation pose to obtain a filtered pose; and

calculate the target pose correction matrix based on the filtered pose and the second integration pose.

11. The apparatus of claim 9 or 10, wherein the interpolation module is configured to:

search for two frames of historical integration poses, wherein integration moments of the two frames of historical integration poses are a moment immediately before the target observation moment and a moment immediately after the target observation moment, respectively; and

perform interpolation on the two frames of historical integration poses.

12. The apparatus of any one of claims 8 to 11, wherein the acquisition module is configured to:

perform integration based on a wheel speed and an angular velocity of the vehicle, starting from an initial pose of the vehicle, to obtain the first integration pose, wherein the initial pose is a pose of the vehicle at startup;

obtain the first observation pose based on global navigation satellite system (GNSS) positioning data of the vehicle; and

obtain the second observation pose based on a visual sensor of the vehicle in combination with map data.

13. The apparatus of claim 12, wherein the acquisition module is configured to:

determine whether an absolute value of a difference between a first relative pose and a second relative pose is less than a preset threshold, wherein the first relative pose is a relative pose between two adjacent frames of observation poses provided by raw GNSS positioning data, and the second relative pose is a relative pose between two frames of integration poses at moments corresponding to the two adjacent frames of observation poses;

if the absolute value is less than the preset threshold, not adjust a first covariance of the raw

GNSS positioning data, and obtain the first observation pose based on the raw GNSS positioning data; and

if the absolute value is greater than or equal to the preset threshold, adjust the first covariance of the raw GNSS positioning data to a first target covariance to obtain the GNSS positioning data, and obtain the first observation pose based on the GNSS positioning data.

14. An electronic device, comprising:

a memory, configured to store a computer program; and

one or more processors, configured to execute the computer program stored in the memory to implement steps of the method of any one of claims 1 to 7.

15. A computer readable storage medium, storing a computer program, wherein the computer program, when executed by one or more processors, implements steps of the method of any one of claims 1 to 7.