CLAIMS

1. A method for information processing, comprising:

acquiring collecting time of collecting a first image frame to be processed;

acquiring calibrated time of the first image frame by correcting the collecting time of the first image frame according to currently calibrated time offset information for the first image frame; and

determining a current location based on the first image frame and inertial sensor information acquired at the calibrated time of the first image frame.

2. The method of claim 1, wherein in response to the first image frame being a first image frame collected or a second image frame collected, the currently calibrated time offset information for the first image frame is an initial time offset.

3. The method of claim 1 or 2, further comprising: in response to the first image frame being an Nth image frame collected, the N being a positive integer greater than 2,

determining the currently calibrated time offset information for the first image frame according to at least two second image frames collected before the collecting time of the first image frame.

4. The method of claim 3, wherein determining the currently calibrated time offset information for the first image frame according to the at least two second image frames collected before the collecting time of the first image frame comprises:

acquiring the at least two second image frames collected before the collecting time of the first image frame;

acquiring inertial sensor information collected at calibrated time of each second image frame of the at least two second image frames; and

determining the currently calibrated time offset information for the first image frame based on the at least two second image frames and the inertial sensor information corresponding to the each second image frame.

5. The method of claim 4, wherein determining the currently calibrated time offset information for the first image frame based on the at least two second image frames and the inertial sensor information corresponding to the each second image frame comprises:

determining, in the at least two second image frames, each group of matching feature points matching a same image feature, wherein the each group of matching feature points comprises multiple matching feature points;

determining location information of a matching feature point in the each second image frame; and

determining the currently calibrated time offset information for the first image frame based on the inertial sensor information collected at the calibrated time of the each second image frame and the location information of the matching feature point in the each second image frame.

6. The method of claim 5, wherein determining the currently calibrated time offset information for the first image frame based on the inertial sensor information collected at the calibrated time of the each second image frame and the location information of the matching feature point in the each second image frame comprises:

determining a location of a spatial point in three-dimensional space corresponding to the matching feature point in the each second image frame;

determining a projection plane where the each second image frame is located according to the inertial sensor information collected at the calibrated time of the each second image frame;

acquiring projection information of the spatial point according to the location of the spatial point and the projection plane where the each second image frame is located; and

determining the currently calibrated time offset information for the first image frame according to the location information of the matching feature point in the each second image frame and the projection information.

7. The method of claim 5, further comprising:

determining an exposure time error of the matching feature point in the each second image frame according to the location information of the matching feature point in the each second image frame and a row exposure period of an image collecting device;

determining a calibrated time error between the currently calibrated time offset information for the first image frame and last calibrated time offset information;

determining a time difference between actual collecting time and the calibrated time of the each second image frame according to the exposure time error and the calibrated time error, wherein the image collecting device is configured to collect the at least two second image frames; and

determining an inertial state corresponding to the each second image frame by estimating posture information of the image collecting device according to the time difference and the inertial sensor information collected at the calibrated time of the each second image frame.

8. The method of claim 3, wherein determining the currently calibrated time offset information for the first image frame according to the at least two second image frames collected before the collecting time of the first image frame comprises:

acquiring last calibrated time offset information for the at least two second image frames;

determining a limit of the currently calibrated time offset information for the first image frame according to a calibrated time error between the currently calibrated time offset information for the first image frame and the last calibrated time offset information; and

determining the currently calibrated time offset information for the first image frame according to the limit of the currently calibrated time offset information for the first image frame.

9. The method of claim 8, wherein determining the limit of the currently calibrated time offset information for the first image frame according to the calibrated time error between the

currently calibrated time offset information for the first image frame and the last calibrated time offset information comprises:

in response to the calibrated time error being less than or equal to a preset time error, determining that the limit of the currently calibrated time offset information for the first image frame is zero; and

in response to the calibrated time error being greater than the preset time error, determining the limit of the currently calibrated time offset information for the first image frame according to the calibrated time error and a preset time offset weight.

10. The method of any one of claims 1 to 9, wherein determining the current location based on the first image frame and the inertial sensor information acquired at the calibrated time of the first image frame comprises:

determining first relative location information representing a location change relation of an image collecting device based on the first image frame and a second image frame collected before the collecting time of the first image frame;

determining second relative location information representing the location change relation of the image collecting device based on the inertial sensor information acquired at the calibrated time of the first image frame and an inertial state corresponding to the second image frame; and

determining the current location according to the first relative location information and the second relative location information.

11. The method of any one of claims 1 to 10, wherein acquiring the calibrated time of the first image frame by correcting the collecting time of the first image frame according to the currently calibrated time offset information for the first image frame comprises:

acquiring the calibrated time of the first image frame by correcting the collecting time of the first image frame according to the currently calibrated time offset information for the first image frame and an exposure duration of the first image frame.

12. A device for information processing, comprising:

an acquiring module configured to acquire collecting time of collecting a first image

frame to be processed;

a correcting module configured to acquire calibrated time of the first image frame by correcting the collecting time of the first image frame according to currently calibrated time offset information for the first image frame; and

a positioning module is configured to determine a current location based on the first image frame and inertial sensor information acquired at the calibrated time of the first image frame.

13. The device of claim 12, wherein in response to the first image frame being a first image frame collected or a second image frame collected, the currently calibrated time offset information for the first image frame is an initial time offset.

14. The device of claim 12 or 13, wherein in response to the first image frame being an Nth image frame collected, the N being a positive integer greater than 2, the device further comprises:

a determining module configured to determine the currently calibrated time offset information for the first image frame according to at least two second image frames collected before the collecting time of the first image frame.

15. The device of claim 14, wherein the determining module is specifically configured to:

acquire the at least two second image frames collected before the collecting time of the first image frame;

acquire inertial sensor information collected at calibrated time of each second image frame of the at least two second image frames; and

determine the currently calibrated time offset information for the first image frame based on the at least two second image frames and the inertial sensor information corresponding to the each second image frame.

~~16. The device of claim 15, wherein the determining module is specifically configured to:~~

~~determine, in the at least two second image frames, each group of matching feature points matching a same image feature, wherein the each group of matching feature points~~

~~comprises multiple matching feature points;~~

~~determine location information of a matching feature point in the each second image frame; and~~

~~determine the currently calibrated time offset information for the first image frame based on the inertial sensor information collected at the calibrated time of the each second image frame and the location information of the matching feature point in the each second image frame.~~

~~17. The device of claim 16, wherein the determining module is specifically configured to:~~

~~determine a location of a spatial point in three dimensional space corresponding to the matching feature point in the each second image frame;~~

~~determine a projection plane where the each second image frame is located according to the inertial sensor information collected at the calibrated time of the each second image frame;~~

~~acquire projection information of the spatial point according to the location of the spatial point and the projection plane where the each second image frame is located; and~~

~~determine the currently calibrated time offset information for the first image frame according to the location information of the matching feature point in the each second image frame and the projection information.~~

~~18. The device of claim 16, wherein the determining module is further configured to:~~

~~determine an exposure time error of the matching feature point in the each second image frame according to the location information of the matching feature point in the each second image frame and a row exposure period of an image collecting device;~~

~~determine a calibrated time error between the currently calibrated time offset information for the first image frame and last calibrated time offset information;~~

~~determine a time difference between actual collecting time and the calibrated time of the each second image frame according to the exposure time error and the calibrated time error, wherein the image collecting device is configured to collect the at least two second image frames; and~~

~~determine an inertial state corresponding to the each second image frame by estimating posture information of the image collecting device according to the time difference and the inertial sensor information collected at the calibrated time of the each second image frame.~~

~~19. The device of claim 14, wherein the determining module is specifically configured to:~~

~~acquire last calibrated time offset information for the at least two second image frames;~~

~~determine a limit of the currently calibrated time offset information for the first image frame according to a calibrated time error between the currently calibrated time offset information for the first image frame and the last calibrated time offset information; and~~

~~determine the currently calibrated time offset information for the first image frame according to the limit of the currently calibrated time offset information for the first image frame.~~

~~20. The device of claim 19, wherein the determining module is specifically configured to:~~

~~in response to the calibrated time error being less than or equal to a preset time error, determine that the limit of the currently calibrated time offset information for the first image frame is zero; and~~

~~in response to the calibrated time error being greater than the preset time error, determine the limit of the currently calibrated time offset information for the first image frame according to the calibrated time error and a preset time offset weight.~~

16~~21~~. The device of any one of claims 12 to 15~~20~~, wherein the positioning module is specifically configured to:

determine first relative location information representing a location change relation of an image collecting device based on the first image frame and a second image frame collected before the collecting time of the first image frame;

determine second relative location information representing the location change relation of the image collecting device based on the inertial sensor information acquired at the calibrated time of the first image frame and an inertial state corresponding to the second image frame; and

determine the current location according to the first relative location information and the second relative location information.

17~~22~~. The device of any one of claims 12 to 16~~21~~, wherein the correcting module is specifically configured to:

acquire the calibrated time of the first image frame by correcting the collecting time of the first image frame according to the currently calibrated time offset information for the first image frame and an exposure duration of the first image frame.

18~~23~~. Electronic equipment, comprising:

a processor; and

a memory configured to store processor-executable instructions,

wherein the processor is configured to implement the method of any one of claims 1 to 11.

19~~24~~. A computer-readable storage medium having stored thereon computer program instructions which, when executed by a processor, implement the method of any one of claims 1 to 11.

20~~25~~. A computer program, comprising a computer readable code which, when run in electronic equipment, allows a processor in the electronic device to implement the method of any one of claims 1 to 11.