

CLAIMS

1. A method for pose and position detection, comprising:

determining first position information of at least one first feature part of a target object within a target image, wherein the target image is taken by a camera device;

determining three-dimensional position information of second feature parts of the target object based on the first position information and device parameters of the camera device, wherein the second feature parts at least comprise the at least one first feature part; and

determining spatial position and pose of the target object based on the first position information of the at least one first feature part comprised in the second feature parts and the three-dimensional position information of the second feature parts.

2. The method of claim 1, wherein determining the first position information of the at least one first feature part of the target object in the target image comprises:

acquiring the information of a first feature part to be identified;

identifying the at least one first feature part in the target object based on the acquired information of the first feature part; and

determining the first position information of the at least one first feature part based on an established two-dimensional coordinate system.

3. The method of claim 1 or 2, wherein determining the three-dimensional position information of the second feature parts of the target object based on the first position information and the device parameters of the camera device comprises:

performing normalization processing on the first position information based on the device parameters of the camera device to obtain second position information; and

determining the three-dimensional position information of the second feature parts by using the second position information.

4. The method of claim 3, wherein performing normalization processing on the first position information based on the device parameters of the camera device to obtain the second position information comprises:

performing first normalization processing on the first position information by using the device parameters to obtain third position information of the at least one first feature part;

determining a mean and a variance of the third position information of the at least one first feature part; and

performing second normalization processing on the third position information based on the mean and the variance to obtain the second position information.

5. The method of claim 4, wherein performing first normalization processing on the first position information by using the device parameters to obtain the third position information of the at least one first feature part comprises:

performing distortion removing processing on the first position information by using the device parameters; and

performing first normalization processing on the first position information obtained by the distortion removing processing to obtain the third position information of the at least one first feature part.

6. The method of claim 1 or 2, wherein determining the three-dimensional position information of the second feature parts of the target object based on the first position

information and the device parameters of the camera device comprises:

performing normalization processing on the first position information based on the device parameters of the camera device to obtain second position information;

determining fourth position information, which is in a three-dimensional form, of the second feature parts by using the second position information; and

performing inverse normalization processing on the fourth position information to obtain the three-dimensional position information of the second feature parts.

7. The method of any one of claims 1 to 6, wherein the step of determining the spatial position and pose of the target object based on the first position information of the at least one first feature part comprised in the second feature parts and the three-dimensional position information of the second feature parts comprises:

determining correction parameters based on the first position information of the first feature part comprised in the second feature parts and the corresponding three-dimensional position information of the comprised first feature part in the second feature parts;

correcting the three-dimensional position information based on the correction parameters; and

determining the spatial position and pose of the target object based on the corrected three-dimensional position information.

8. The method of claim 7, wherein determining the correction parameters based on the first position information of the first feature part comprised in the second feature parts and the corresponding three-dimensional position information of the comprised first feature part in the second feature parts comprises:

converting the three-dimensional position information of the first feature part in the second feature parts into fifth position information in a two-dimensional form by using a

rotation matrix and a translation matrix;

performing feedback-based adjustment on the rotation matrix and the translation matrix based on a difference between the fifth position information and the second position information until the difference meets a preset requirement, wherein the second position information is obtained based on a normalization processing of the first position information; and

determining the correction parameters based on the rotation matrix and the translation matrix when the difference meets the preset requirement.

9. The method of any one of claims 1 to 8, further comprising:

acquiring a target image; and

identifying a target object in the target image.

10. The method of any one of claims 1 to 9, wherein the first feature part comprises at least one of a head, a neck, shoulders, elbows, wrists, hips, knees and ankles.

11. A device for pose and position detection, comprising:

a first determining module configured to determine first position information of at least one first feature part of a target object within a target image, wherein the target image is taken by a camera device;

a second determining module configured to determine three-dimensional position information of second feature parts of the target object based on the first position information and device parameters of the camera device, wherein the second feature parts at least comprise the first feature part; and

a third determining module configured to determine spatial position and pose of the

target object based on the first position information of the at least one first feature part comprised in the second feature parts and the three-dimensional position information of the second feature parts.

12. The device of claim 11, wherein the first determining module comprises:

an information acquisition unit configured to acquire the information of the first feature part to be identified;

a feature identification unit configured to identify the at least one first feature part in the target object based on the acquired information of the first feature part; and

a two-dimensional position determining unit configured to determine the first position information of the at least one first feature part based on an established two-dimensional coordinate system.

13. The device of claim 11 or 12, wherein the second determining module comprises:

a normalization unit configured to perform normalization processing on the first position information based on the device parameters of the camera device to obtain second position information; and

a three-dimensional position determining unit configured to determine the three-dimensional position information of the second feature parts by using the second position information.

14. The device of claim 13, wherein the normalization unit is further configured to perform first normalization processing on the first position information by using the device parameters to obtain third position information of the at least one first feature part, determine a mean and a variance of the third position information of the at least one first feature part, and perform second normalization processing on the third position information based on the mean and the variance to obtain the second position information.

15. The device of claim 14, wherein the normalization unit is further configured to perform distortion removing processing on the first position information by using the device parameters, and perform first normalization processing on the first position information obtained by the distortion removing processing to obtain the third position information of the at least one first feature part.

16. The device of claim 11 or 12, wherein the second determining module comprises:

a normalization unit configured to perform normalization processing on the first position information based on the device parameters of the camera device to obtain second position information;

a three-dimensional position determining unit configured to determine fourth position information, which is in a three-dimensional form, of the second feature parts by using the second position information; and

an inverse normalization unit configured to perform inverse normalization processing on the fourth position information to obtain the three-dimensional position information of the second feature parts.

17. The device of any one of claims 11 to 16, wherein the third determining module comprises:

a correction parameter determining unit configured to determine correction parameters based on the first position information of the first feature part comprised in the second feature parts and the corresponding three-dimensional position information of the comprised first feature part in the second feature parts;

a correction unit configured to correct the three-dimensional position information based on the correction parameters; and

a position and pose determining unit configured to determine the spatial position and pose of the target object based on the corrected three-dimensional position information.

18. The device of claim 17, wherein the correction parameter determining unit is further configured to convert the three-dimensional position information of the first feature part in the second feature parts into fifth position information in a two-dimensional form by using a rotation matrix and a translation matrix;

perform feedback-based adjustment on the rotation matrix and the translation matrix based on a difference between the fifth position information and the second position information until the difference meets a preset requirement, wherein the second position information is obtained based on a normalization processing of the first position information; and

determine the correction parameters based on the rotation matrix and the translation matrix when the difference meets the preset requirement.

19. An electronic device, comprising:

a processor, and

a memory configured to store executable instructions of the processor,

wherein the processor is configured to: perform the method of any one of claims 1 to 10.

20. A computer-readable storage medium having stored thereon computer program instructions that when performed by a processor, implement the method of any one of claims 1 to 10.