CLAIMS

1. An object recognition method, comprising:

acquiring a real-time image where a screen comprises an object operation region;

determining, according to a mapping relationship between the real-time image and a preset standard image, image reference points that match with at least two reference origins in the real-time, wherein the reference origin is a point within the object operation region in the preset standard image; and

recognizing an object within the object operation region according to a pixel coordinate of the preset standard image and a reference pixel coordinate of the image reference point in the real-time image to obtain a target recognition result of the object,

wherein the recognizing an object within the object operation region according to a pixel coordinate of the preset standard image and a reference pixel coordinate of the image reference point in the real-time image to obtain a target recognition result of the object, comprises:

determining a linear function matching at least two of the image reference points according to the reference pixel coordinates of the at least two of the image reference points in the real-time image; and

recognizing an object within an object operation region of the real-time image according to the linear function, a pixel coordinate of the preset standard image, and the real-time image to obtain the target recognition result,

wherein the recognizing an object within an object operation region of the real-time image according to the linear function, a pixel coordinate of the preset standard image, and the real-time image to obtain the target recognition result, comprises:

inputting a pixel coordinate of the preset standard image into the linear function to obtain a to-be-compared coordinate;

numerically comparing the pixel coordinate of the preset standard image with the to-be-compared coordinate to obtain a comparison result;

recognizing an object within the object operation region in the real-time image to obtain a to-be-adjusted recognition result; and

determining an target recognition result of the object according to the comparison result and to-be-adjusted recognition result.

2. The method according to claim 1, wherein the acquiring a real-time image where a screen comprises an object operation region comprises:

acquiring an image collection apparatus that has a preset inclination angle with the object operation region; and

collecting the object operation region by adopting the image collection apparatus to obtain the real-time image.

3. The method according to claim 1 or 2, wherein before determining, according to the mapping relationship between the real-time image and a preset standard image, image reference points that match with at least two reference origins in the real-time image, the method further comprises:

determining a transformation matrix between a pixel coordinate of the real-time image and a pixel coordinate of the preset standard image; and

determining the mapping relationship according to the transformation matrix.

4. The method according to any one of claims 1 to 3, wherein the method further comprises:

determining a first collection angle of the real-time image; and

collecting the object operation region by adopting a second collection angle to obtain the preset standard image, wherein a difference between the second collection angle and the first collection angle is less than a preset angle threshold.

5. The method according to claim 3 or 4, wherein the determining a transformation matrix between a pixel coordinate of the real-time image and a pixel coordinate of the preset standard image comprises:

determining, in the preset standard image, a preset reference point and a first pixel coordinate of the preset reference point;

determining, in the real-time image, a second pixel coordinate of an image mapping point that matches the preset reference point; and

determining a transformation matrix between the first pixel coordinate and the second pixel coordinate.

6. The method according to any one of claims 3 to 5, wherein the determining, according to the mapping relationship between the real-time image and a preset standard image, image reference points that match with at least two reference origins in the real-time image comprises:

projecting each of the reference origins into the real-time image according to the mapping relationship to obtain the image reference point matching each of the reference origins.

7. The method according to claim 1, wherein in a case where the preset standard image is a top view standard image, the determining an target recognition result of the object according to the comparison result and to-be-adjusted recognition result comprises:

in a case where the comparison result represents that the pixel coordinate of the preset standard image is less than or equal to the to-be-compared coordinate, acquiring a right side view image where a screen comprises the object operation region;

recognizing the object within the object operation region in the right side view image to obtain a first recognition result; and

adjusting the to-be-adjusted recognition result according to the first recognition result to obtain the target recognition result.

8. The method according to claim 1, wherein in a case where the preset standard image is a top view standard image, the determining an target recognition result of the object according to the comparison result and to-be-adjusted recognition result comprises:

in a case where the comparison result represents that the pixel coordinate of the preset standard image is greater than or equal to the to-be-compared coordinate, acquiring a left side view image where a screen comprises the object operation region;

recognizing the object within the object operation region in the left side view image to obtain a second recognition result; and

adjusting the to-be-adjusted recognition result according to the second recognition result to obtain the target recognition result.

9. An object recognition apparatus, comprising:

an acquisition module, configured to acquire a real-time image where a screen comprises an object operation region;

a determination module, configured to determine, according to the mapping relationship between the real-time image and a preset standard image, image reference points that match with at least two reference origins in the real-time image, wherein the reference origin is a point within the object operation region in the preset standard image; and

a recognition module, configured to recognize an object within the object operation region according to a pixel coordinate of the preset standard image and a reference pixel coordinate of the image reference point in the real-time image to obtain a target recognition result of the object,

wherein the recognition module comprises a function determination sub-module and a recognition sub-module,

wherein the function determination sub-module is configured to:

determine a linear function matching at least two of the image reference points according to the reference pixel coordinates of the at least two of the image reference points in the real-time image;

wherein the recognition sub-module is configured to:

recognize an object within an object operation region of the real-time image according to the linear function, a pixel coordinate of the preset standard image, and the real-time image to obtain the target recognition result,

wherein the recognition sub-module comprises an input sub-unit, a comparison sub-unit, a recognition sub-unit, and a determination sub-unit, wherein

the input sub-unit is configured to input a pixel coordinate of the preset standard image into the linear function to obtain a to-be-compared coordinate;

the comparison sub-unit is configured to numerically compare the pixel coordinate of the preset standard image with the to-be-compared coordinate to obtain a comparison result;

the recognition sub-unit is configured to recognize an object within the object operation region in the real-time image to obtain a to-be-adjusted recognition result; and

the determination sub-unit is configured to determine a target recognition result of the object according to the comparison result and to-be-adjusted recognition result.

10. The object recognition apparatus according to claim 9, wherein the acquisition module is further configured to:

acquire an image collection apparatus that has a preset inclination angle with the object operation region; and

collect the object operation region by adopting the image collection apparatus to obtain the real-time image.

11. The object recognition apparatus according to claim 9 or 10, wherein the object recognition apparatus further comprises a mapping determination module, and the mapping determination module is configured to:

determine a transformation matrix between a pixel coordinate of the real-time image and a pixel coordinate of the preset standard image; and

determine the mapping relationship according to the transformation matrix.

12. The object recognition apparatus according to any one of claims 9 to 11, wherein the object recognition apparatus further comprises a standard image acquisition module, and the standard image acquisition module is configured to:

determine a first collection angle of the real-time image; and

collect the object operation region by adopting a second collection angle to obtain the preset standard image, wherein the difference between the second collection angle and the first collection angle is less than a preset angle threshold.

13. The object recognition apparatus according to claim 11 or 12, wherein the mapping determination module comprises a pixel coordinate sub-module and a matrix determination sub-module,

wherein the pixel coordinate sub-module is configured to:

determine a preset reference point and a first pixel coordinate of the preset reference point in the preset standard image; and

determine a second pixel coordinate of an image mapping point that matches the preset reference point in the real-time image;

wherein the matrix determination sub-module is configured to determine the transformation matrix between the first pixel coordinate and the second pixel coordinate.

14. The object recognition apparatus according to any one of claims 11 to 13, wherein the determination module is further configured to project each of the reference origins into the real-time image according to the mapping relationship to obtain the image reference point matching each of the reference origins.

15. A computer device, wherein the computer device comprises a memory storing computer-executable instructions thereon and a processor, when the processor runs the computer-executable instructions stored on the memory, the object recognition method according to any one of claims 1 to 8 can be implemented.

16. A computer storage medium, wherein computer-executable instructions are stored on the computer storage medium, and after the computer-executable instructions are executed, the object recognition method according to any one of claims 1 to 8 can be implemented.

17. A computer program product, comprising computer readable codes, wherein when the computer readable codes run in a device, a processor in the device executes instructions for implementing the steps in the method according to any one of claims 1 to 8.