CLAIMS

1. A method for identifying a state, comprising:

acquiring a to-be-detected image for a specific scene, and determining a region of interest in the to-be-detected image, wherein the specific scene comprises a storage container configured to store specific objects, the storage container comprises an upper layer and a lower layer, each layer is provided with multiple storage spaces, and each storage space is configured to store a portion of the specific objects; when the upper layer of the storage container is pushed outward in horizontal direction, the storage container is in an open state to expose the lower layer of the storage container, and when the upper layer of the storage container is pushed back in the horizontal direction, the storage container is in a closed state; and the region of interest is a region obtained by substracting an occlusion range of the storage container in a closed state from an occlusion range of the storage container in an open state;

determining a positional relation between the region of interest and specific object regions in which the specific objects are positioned in the to-be-detected image;

determining at least one value based on pixel values of pixels in the region of interest when the positional relation represents that there is no specific object region partially overlapping the region of interest, wherein each value represents a number of storage spaces in the storage container configured to place the specific objects; and

determining whether the storage container is in an open state or a closed state based on the at least one value and a preset value range.

2. The method of claim 1, wherein the step of determining whether the storage container is in the open state or the closed state based on the at least one value and the preset value range comprises:

determining a target value from the at least one value; and

determining whether the storage container is in the open state or the closed state based on the target value and the preset value range.

3. The method of claim 2, wherein the step of determining whether the storage container is in the open state or the closed state based on the target value and the preset value range comprises:

determining that the storage container is in an open state, when the target value falls within the preset value range; and/or

determining that the storage container is in a closed state, when the target value does not fall within the preset value range.

4. The method of claim 1, wherein the step of determining the region of interest in the to-be-detected image comprises:

acquiring a preset standard image of the specific scene, wherein the preset standard image comprises a preset standard region;

determining a mapping relation between the preset standard image and the to-be-detected image; and

determining the region of interest mapped with the preset standard region in the to-be-detected image according to the mapping relation.

5. The method of claim 4, wherein the step of determining the region of interest mapped with the preset standard region in the to-be-detected image according to the mapping relation comprises:

determining multiple mapped boundary coordinate vertices according to the mapping relation and multiple boundary coordinate vertices of the preset standard region; and

determining the region of interest according to a region determined from the mapped boundary coordinate vertices.

6. The method of claim 2, wherein the step of determining the target value from the at least one value comprises:

determining an average value based on the at least one value, and determining the average value as the target value.

7. The method of claim 1 or 6, wherein the step of determining the at least one value based on the pixel values of the pixels in the region of interest comprises:

determining a bounding rectangle region corresponding to the region of interest;

increasing or decreasing a number of the pixel values of pixels in each horizontal direction of at least one horizontal direction in the bounding rectangle region to a specific number to obtain a pixel value array corresponding to the horizontal direction, wherein each horizontal direction is represented by a horizontal line having a preset width in the region of interest;

performing Fast Fourier Transform on the pixel value array corresponding to the horizontal direction to obtain at least one frequency value corresponding to each horizontal direction; and

determining a maximum frequency value from the at least one frequency value, and determining the maximum frequency value corresponding to each horizontal direction of the at least one horizontal direction as the at least one value.

8. The method of any one of claims 1 to 6, wherein the step of determining the positional relation between the region of interest and the specific object regions in which the specific objects are positioned in the to-be-detected image comprises at least one of:

determining a dimension scale of the specific object region when the region of interest of the to-be-detected image comprises the specific objects; determining that the positional relation represents that there is no specific object region partially overlapping the region of interest when the dimension scale is smaller than or equal to a preset scale; and

determining the positional relation represents that there is no specific object region partially overlapping the region of interest when the region of interest does not comprise the specific objects.

9. The method of claim 8, wherein, after determining the dimension scale of each specific object region, the method further comprises:

determining that the positional relation represents that there is a specific object region at least partially overlapping the region of interest when the dimension scale of the specific object

region is larger than the preset scale and the specific object region overlaps the region of interest; and

determining that the storage container is in an open state when the positional relation represents that there is a specific object region at least partially overlapping the region of interest.

10. The method of claim 9, further comprising:

when the to-be-detected image comprises the specific objects, and at least one vertex on any midline segment of the specific object region is positioned outside the region of interest, and at least one point on any midline segment is positioned within the region of interest, determining that the specific object region overlaps the region of interest.

11. A device for identifying a sate, comprising:

an acquiring unit, configured to acquire a to-be-detected image for a specific scene; and

a determining unit, configured to determine a region of interest in the to-be-detected image, wherein the specific scene comprises a storage container configured to store specific objects, the storage container comprises an upper layer and a lower layer, each layer is provided with multiple storage spaces, and each storage space is configured to store a portion of the specific objects; when the upper layer of the storage container is pushed outward in horizontal direction, the storage container is in an open state to expose the lower layer of the storage container, and when the upper layer of the storage container is pushed back in the horizontal direction, the storage container is in a closed state, and the region of interest is a region obtained by substracting an occlusion range of the storage container in a closed state from an occlusion range of the storage container in an open state; to determine a positional relation between the region of interest and specific object regions in which the specific objects are positioned in the to-be-detected image; to determine at least one value based on pixel values of pixels in the region of interest when the positional relation represents that there is no specific object region partially overlapping the region of interest, wherein each value represents a number of storage spaces in the storage container configured to place the specific objects; and to determine whether the storage container is in an open state or a closed state based on the at least one value and a preset value range.

12. The device of claim 11, wherein the determination unit is configured to:

determine a target value from the at least one value; and

determine whether the storage container is in the open state or the closed state based on the target value and the preset value range.

13. The device of claim 12, wherein the determination unit is configured to:

determine that the storage container is in an open state, when the target value falls within the preset value range; and/or

determine that the storage container is in a closed state, when the target value does not fall within the preset value range.

14. The device of claim 11, wherein the determination unit is configured to:

acquire a preset standard image of the specific scene, wherein the preset standard image comprises a preset standard region;

determine a mapping relation between the preset standard image and the to-be-detected image; and

determine the region of interest mapped with the preset standard region in the to-be-detected image according to the mapping relation.

15. The device of claim 14, wherein the determination unit is configured to:

determine multiple mapped boundary coordinate vertices according to the mapping relation and multiple boundary coordinate vertices of the preset standard region; and

determine the region of interest according to a region determined from the mapped boundary coordinate vertices.

16. The device of claim 12, wherein the determination unit is configured to:

determine an average value based on the at least one value, and determining the average value as the target value.

17. The device of claim 11 or 16, wherein the determination unit is configured to:

determine a bounding rectangle region corresponding to the region of interest;

increase or decrease a number of the pixel values of pixels in each horizontal direction of at least one horizontal direction in the bounding rectangle region to a specific number to obtain a pixel value array corresponding to the horizontal direction, wherein each horizontal direction is represented by a horizontal line having a preset width in the region of interest;

perform Fast Fourier Transform on the pixel value array corresponding to the horizontal direction to obtain at least one frequency value corresponding to each horizontal direction; and

determine a maximum frequency value from the at least one frequency value, and determine the maximum frequency value corresponding to each horizontal direction of the at least one horizontal direction as the at least one value.

18. The device of any one of claims 11 to 16, wherein the determination unit is configured to:

determine a dimension scale of the specific object region when the region of interest of the to-be-detected image comprises the specific objects; determine that the positional relation represents that there is no specific object region partially overlapping the region of interest when the dimension scale is smaller than or equal to a preset scale; and/or

determine the positional relation represents that there is no specific object region partially overlapping the region of interest when the region of interest does not comprise the specific objects.

19. An electronic device, comprising:

a memory, configured to store an executable computer program; and

a processor, configured to implement the method of any one of claims 1 to 10 when executing the executable computer program stored in the memory.

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