

CLAIMS

1. An image processing method, comprising:

acquiring at least two target images;

determining an attention map of at least one target in each of the at least two target images according to a result of detecting one or more targets of each target image, wherein the attention map indicates the position of one target in the target image; and

determining, based on each target image and the attention map of the at least one target in the each target image, a result of association that indicates whether a correspondence exists between at least some of the targets in different target images, the each target image and the attention map thereof being parallel inputs to be processed in the determining

2. The method according to claim 1, wherein the determining an attention map of at least one target in each of the at least two target images according to a result of detecting one or more targets of each target image comprises:

for one target in each target image, determining, according to the result of detecting one or more targets of the each target image, a first image region where the target is located; and

determining the attention map of the target according to the first image region in the target image and a second image region other than the first image region in the target image.

3. The method according to claim 2, wherein the determining the attention map of the target according to the first image region in the target image and the second image region other than the first image region in the target image comprises:

acquiring an initial image with an image size matching that of the target image;

setting a pixel value of a pixel in a first target image region in the initial image as a first pixel value, wherein the first target image region corresponds to the first image region; and

setting a pixel value of a pixel in a second target image region in the initial image as a second pixel value to obtain the attention map of the target, wherein the second target

image region corresponds to the second image region, and the first pixel value is not equal to the second pixel value.

4. The method according to any one of claims 1 to 3, wherein the determining, based on each target image and the attention map of the at least one target in the each target image, a result of association that indicates whether a correspondence exists between at least some of targets in different target images, the each target image and the attention map thereof being parallel inputs to be processed in the determining, comprises:

fusing a target image with the attention map of one target in the target image to obtain a to-be-processed image;

performing feature extraction on each to-be-processed image respectively to obtain a feature map of the each to-be-processed image; and

determining, according to the feature map of the each to-be-processed image, the result of association that indicates whether the correspondence exists between at least some of the targets in different target images.

5. The method according to claim 4, wherein the fusing a target image with the attention map of one target in the target image to obtain a to-be-processed image comprises:

splicing a target image with the attention map of one target in the target image in a set dimension to obtain a to-be-processed image; or

adding a target image with the attention map of one target in the target image in a set dimension to obtain a to-be-processed image.

6. The method according to claim 4, wherein the determining, according to the feature map of the each to-be-processed image, the result of association that indicates whether the correspondence exists between at least some of the targets in different target images comprises:

performing feature association on feature maps of any two of the to-be-processed images to obtain an associated feature map; and

determining, based on the associated feature map, the result of association that indicates whether the correspondence exists between targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated.

7. The method according to claim 6, wherein the determining, based on the associated feature map, the result of association that indicates whether the correspondence exists between

targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated, comprises:

obtaining, based on the associated feature map, a score of association between targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated;

in a case that the score of association is greater than a score threshold, determining that the targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, are potentially associated;

in a case that the score of association is less than or equal to the score threshold, determining that the targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, are not associated.

8. The method according to claim 6, wherein the determining, based on the associated feature map, the result of association that indicates whether the correspondence exists between targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated, comprises:

obtaining, based on the associated feature map, a score of association between targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated; and

matching, according to the score of association between the respective targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, targets in different target images to obtain a result of association that indicates whether a correspondence exists between respective targets in the different target images, wherein matched targets belong to different target images.

9. The method according to claim 8, wherein the matching, according to the score of association between the respective targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, targets in different target images to obtain a result of association that indicates whether a correspondence exists between respective targets in the different target images, comprises:

determining, according to the score of association between the respective targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, a sum of scores of association between respective targets in a first

target image in the different target images and respective targets in a second target image in the different target images;

in a case that the sum of scores of association is the maximum and greater than a predetermined sum-of-scores threshold, determining that the targets in the first target image respectively match the targets in the second target image;

in a case that the maximum sum of scores of association in the sums of scores of association is less than or equal to the sum-of-scores threshold, determining that the targets in the first target image do not match the targets in the second target image.

10. An image processing apparatus, comprising:

an acquisition module, configured to acquire at least two target images;

a first determination module, configured to determine an attention map of at least one target in each of the at least two target images according to a result of detecting one or more targets of each target image, wherein an attention map indicates the position of one target in a target image; and

a second determination module, configured to determine, based on each target image and the attention map of the at least one target in the each target image, a result of association that indicates whether a correspondence exists between at least some of the targets in different target images, the each target image and the attention map thereof being parallel inputs to be processed in the determining.

11. The apparatus according to claim 10, wherein the first determination module comprises:

a first determination sub-module, configured to determine, according to the result of detecting one or more targets of each target image, a first image region where the target is located for one target in the each target image; and

a second determination sub-module, configured to determine the attention map of the target according to the first image region in the target image and a second image region other than the first image region in the target image.

12. The apparatus according to claim 11, wherein the second determination sub-module comprises:

an acquisition unit, configured to acquire an initial image with an image size matching

that of the target image;

a first setting unit, configured to set a pixel value of a pixel in a first target image region in the initial image as a first pixel value, wherein the first target image region corresponds to the first image region; and

a second setting unit, configured to set a pixel value of a pixel in a second target image region in the initial image as a second pixel value to obtain the attention map of the target, wherein the second target image region corresponds to the second image region, and the first pixel value is not equal to the second pixel value.

13. The apparatus according to any one of claims 10 to 12, wherein the second determination module comprises:

a fusion sub-module, configured to fuse a target image with the attention map of one target in the target image to obtain a to-be-processed image;

a feature extraction sub-module, configured to perform feature extraction on each to-be-processed image respectively to obtain a feature map of the each to-be-processed image; and

a determination sub-module, configured to determine, according to the feature map of the each to-be-processed image, the result of association that indicates whether the correspondence exists between at least some of the targets in different target images.

14. The apparatus according to claim 13, wherein the fusion sub-module comprises:

a splicing unit, configured to splice a target image with the attention map of one target in the target image in a set dimension to obtain a to-be-processed image; or

a summing unit, configured to add a target image with the attention map of one target in the target image in a set dimension to obtain a to-be-processed image.

15. The apparatus according to claim 13, wherein the feature extraction sub-module comprises:

an association unit, configured to perform feature association on feature maps of any two of the to-be-processed images to obtain an associated feature map; and

a determination unit, configured to determine, based on the associated feature map, the result of association that indicates whether the correspondence exists between targets in target images corresponding to the two to-be-processed images, the feature maps of

which are associated.

16. The apparatus according to claim 15, wherein the determination unit comprises:

a first association sub-unit, configured to obtain, based on the associated feature map, a score of association between targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated;

a first determination sub-unit, configured to, in a case that the score of association is greater than a score threshold, determine that the targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, are potentially associated;

a second determination sub-unit, configured to, in a case that the score of association is less than or equal to the score threshold, determine that the targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, are not associated.

17. The apparatus according to claim 15, wherein the determination unit comprises:

a second association sub-unit, configured to obtain, based on the associated feature map, a score of association between targets in target images corresponding to the two to-be-processed images, the feature maps of which are associated; and

a matching sub-unit, configured to match, according to the score of association between the respective targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, targets in different target images to obtain a result of association that indicates whether a correspondence exists between respective targets in the different target images, wherein matched targets belong to different target images.

18. The apparatus according to claim 17, wherein the matching sub-unit is configured to:

determine, according to the score of association between the respective targets in the target images corresponding to the two to-be-processed images, the feature maps of which are associated, a sum of scores of association between respective targets in a first target image in the different target images and respective targets in a second target image in the different target images;

in a case that the sum of scores of association is the maximum and greater than a predetermined sum-of-scores threshold, determine that the targets in the first target image respectively match the targets in the second target image;

in a case that the maximum sum of scores of association in the sums of scores of association is less than or equal to the sum-of-scores threshold, determine that the targets in the first target image do not match the targets in the second target image.

19. An electronic device, comprising:

a processor; and

a memory configured to store processor-executable instructions,

wherein the processor is configured to invoke the instructions stored in the memory, so as to execute the method according to any one of claims 1 to 9.

20. A computer-readable storage medium, having computer program instructions stored thereon, wherein when the computer program instructions are executed by a processor, the method according to any one of claims 1 to 9 is implemented.