

CLAIMS

1. A medical image processing method, comprising:

detecting a medical image by using a first detection module to obtain first position information of a first target in a second target, wherein the second target comprises at least two of the first targets; and

segmenting the second target by using the first detection module according to the first position information to obtain a target feature map of the first target and a first diagnostic auxiliary information of the first target.

2. The method according to claim 1, wherein

the segmenting the second target by using the first detection module according to the first position information to obtain the target feature map of the first target and the first diagnostic auxiliary information of the first target comprises:

performing a pixel-level segmentation on the second target by using the first detection module according to the first position information to obtain the target feature map and the first diagnostic auxiliary information.

3. The method according to claim 1 or 2, further comprising:

detecting the medical image by using a second detection module to obtain second position information of the second target in the medical image; and

segmenting from the medical image an image to be processed comprising the second target according to the second position information; and

the detecting the medical image by using the first detection module to obtain the first position information of the first target in the second target comprising:

detecting the image to be processed by using the first detection module to obtain the first position information.

4. The method according to any one of claims 1 to 3, wherein

the detecting the medical image by using the first detection module to obtain the first

position information of the first target in the second target comprises:

detecting the image to be processed or the medical image by using the first detection module to obtain an image detection region of the first target;

detecting the image detection region to obtain outer contour information of the first target; and

generating a mask region according to the outer contour information, wherein the mask region is configured to segment the second target to obtain a segmented image of the first target.

5. The method according to claim 4, wherein

the processing the image to be processed by using the first detection module, and extracting the target feature map comprising the first target and the first diagnostic auxiliary information of the first target comprises:

processing the segmented image to obtain the target feature map, wherein one target feature map corresponds to one first target; and

obtaining the first diagnostic auxiliary information of the first target based on at least one of the image to be processed, the target feature map, or the segmented image.

6. The method according to claim 5, wherein

the processing the segmented image to obtain the target feature map comprises:

extracting from the segmented image a first feature map by using a feature extraction layer of the first detection module;

generating at least one second feature map by using a pooling layer of the first detection module based on the first feature map, wherein a scale of the first feature map is different from a scale of the second feature map; and

obtaining the target feature map according to the second feature map.

7. The method according to claim 6, wherein

the processing the segmented image to obtain the target feature map comprises:

performing up-sampling on the second feature map by using an up-sampling layer of the first detection module to obtain a third feature map;

fusing the first feature map and the third feature map by using a fusion layer of the first

detection module to obtain a fusion feature map; or fusing the third feature map and the second feature map different from the third feature map in scale to obtain a fusion feature map; and

outputting the target feature map by using an output layer of the first detection module according to the fusion feature map.

8. The method according to claim 6, wherein

the obtaining the first diagnostic auxiliary information of the first target based on at least one of the image to be processed, the target feature map, or the segmented image comprises at least one of the following:

determining first identification information of the first target corresponding to the target feature map by combining the image to be processed and the segmented image;

determining attribute information of the first target based on the target feature map; or

determining prompt information generated on the basis of the attribute information of the first target based on the target feature map.

9. The method according to any one of claims 3 to 8, further comprising:

obtaining the second detection module and the first detection module by training by using sample data; and

calculating loss values of the second detection module and the first detection module in which network parameters are obtained based on a loss function; and

if the loss values are less than or equal to a preset value, completing the training of the second detection module and the first detection module; or, optimizing the network parameters according to the loss values if the loss values are greater than the preset value.

10. The method according to claim 9, wherein

the optimizing the network parameters according to the loss values if the loss values are greater than the preset value comprises:

updating the network parameters by using a back propagation approach if the loss values are greater than the preset value.

11. The method according to claim 9, wherein

the calculating the loss values of the second detection module and the first detection module in which network parameters are obtained based on the loss function comprises:

calculating, by using one loss function, an end-to-end loss value which is input from the second detection module and output from the first detection module.

12. The method according to any one of claims 1 to 11, wherein

the first detection module comprises: a first neural network model;

and/or,

the second detection module comprises: a second neural network model.

13. The method according to any one of claims 1 to 12, wherein

the second target is a spine; and

the first target is: an intervertebral disc.

14. A medical image processing apparatus, comprising:

a first detection unit, configured to detect a medical image by using a first detection module, and obtain first position information of a first target in a second target, wherein the second target comprises at least two of the first targets; and

a processing unit, configured to segment the second target by using the first detection module according to the first position information to obtain a target feature map of the first target and a first diagnostic auxiliary information of the first target.

15. The apparatus according to claim 14, wherein

the processing unit is configured to perform a pixel-level segmentation on the second target by the first detection module according to the first position information to obtain the target feature map and the first diagnostic auxiliary information.

16. The apparatus according to claim 14 or 15, further comprising:

a second detection unit, configured to detect the medical image by using a second detection module to obtain second position information of the second target in the medical image; and segment from the medical image an image to be processed comprising the second

target according to the second position information; and

the first detection unit, configured to detect by the first detection module the image to be processed to obtain the first position information.

17. The apparatus according to any one of claims 14 to 16, wherein

the first detection unit is configured to detect by the first detection module the image to be processed or the medical image to obtain an image detection region of the first target; detect the image detection region to obtain outer contour information of the first target; and generate a mask region according to the outer contour information, wherein the mask region is configured to segment the second target to obtain the first target.

18. A computer storage medium, wherein the computer storage medium stores computer executable codes; after the computer executable codes are executed, a method provided according to any one of claims 1 to 13 can be implemented.

19. A computer program product, wherein the program product comprises computer executable instructions; after the computer executable instructions are executed, the method provided according to any one of claims 1 to 13 can be implemented.

20. An image processing device, comprising:

a memory, configured to store information;

a processor, connected to the memory, and configured to execute computer executable instructions stored on the memory to implement the method provided according to any one of claims 1 to 13.