

CLAIMS

1. A method for image processing, comprising:

acquiring an image sequence to be processed;

obtaining a target image sequence section by determining, in the image sequence to be processed, an image sequence section where a target image is located; and

determining an image region corresponding to at least one image feature class in the target image sequence section by segmenting the target image in the target image sequence section.

2. The method of claim 1, wherein obtaining the target image sequence section by determining, in the image sequence to be processed, the image sequence section where the target image is located comprises:

determining a sampling step length for the image sequence to be processed;

obtaining sampled images by acquiring images from the image sequence to be processed according to the sampling step length;

determining a sampled image with a target image feature according to image features of the sampled images; and

obtaining the target image sequence section by determining, according to a position where the sampled image with the target image feature is arranged in the image sequence, the image sequence section where the target image is located.

3. The method of claim 1 or 2, wherein determining the image region corresponding to the at least one image feature class in the target image sequence section by segmenting the target

image in the target image sequence section comprises:

determining the image region corresponding to the at least one image feature class in the target image in the target image sequence section by segmenting the target image in the target image sequence section based on the target image in the target image sequence section and preset relative position information.

4. The method of claim 3, wherein determining the image region corresponding to the at least one image feature class in the target image in the target image sequence section by segmenting the target image in the target image sequence section based on the target image in the target image sequence section and the preset relative position information comprises:

generating input information in an image processing period based on a preset number of continuous target images in the target image sequence section and the preset relative position information;

performing at least one layer of convolution processing on the input information to determine an image feature class that each pixel in the target image in the target image section belongs to; and

determining the image region corresponding to the at least one image feature class in the target image in the target image sequence section according to the image feature class that each pixel in the target image belongs to.

5. The method of claim 4, wherein the convolution processing comprises up-sampling operation and down-sampling operation, and performing the at least one layer of convolution processing on the input information to determine the image feature class that each pixel in the target image belongs to comprises:

obtaining, based on the input information, a feature map input for the down-sampling operation;

down-sampling the feature map input for the down-sampling operation to obtain a first feature map output by the down-sampling operation;

obtaining, based on the first feature map output by the down-sampling operation, a feature map input for the up-sampling operation;

up-sampling the feature map input for the up-sampling operation to obtain a second feature map output by the up-sampling operation; and

determining the image feature class that each pixel in the target image belongs to based on a second feature map output by a final layer of up-sampling operation.

6. The method of claim 5, wherein the convolution processing further comprises atrous convolution operation, and obtaining, based on the first feature map output by the down-sampling operation, the feature map input for the up-sampling operation comprises:

obtaining, based on a first feature map output by a final layer of down-sampling operation, a feature map input for at least one layer of atrous convolution operation;

executing the at least one layer of atrous convolution operation on the feature map input for the at least one layer of atrous convolution operation to obtain a third feature map after the atrous convolution operation, wherein a size of the third feature map obtained by means of the atrous convolution operation decreases as a number of atrous convolution operation layers increases; and

obtaining, according to the third feature map obtained by means of the atrous convolution operation, the feature map input for the up-sampling operation.

7. The method of claim 6, wherein obtaining, according to the third feature map obtained by means of the atrous convolution operation, the feature map input for the up-sampling operation comprises:

performing feature fusion on a plurality of third feature maps obtained by the at least

one layer of atrous convolution operation, to obtain a first fusion feature map; and

obtaining, based on the first fusion feature map, the feature map input for the up-sampling operation.

8. The method of claim 5, wherein obtaining, based on the first feature map output by the down-sampling operation, the feature map input for the up-sampling operation comprises:

in the case that up-current up-sampling operation is a first layer of up-sampling operation, obtaining the feature map input for the current up-sampling operation according to the first feature map output by the final layer of down-sampling operation;

in the case that the current up-sampling operation is a second or higher layer of up-sampling operation, fusing a second feature map output by a previous layer of up-sampling operation and a first feature map that is matched with and in a same feature map size as the second feature map output by the previous layer of up-sampling operation, to obtain a second fusion feature map; and

obtaining, based on the second fusion feature map, the feature map input for the current up-sampling operation.

9. The method of any one of claims 1-8, wherein after determining the image region corresponding to the at least one image feature class in the target image sequence section, the method further comprises:

comparing an image feature class corresponding to each pixel in the target image in the target image sequence section with a respective labeled reference image feature class to obtain a comparison result;

determining, according to the comparison result, a first loss and a second loss occurred in the image processing; and

adjusting, based on the first loss and the second loss, a processing parameter used in

the image processing, to enable the image feature class corresponding to each pixel in the target image to be the same as the respective reference image feature class.

10. The method of claim 9, wherein adjusting, based on the first loss and the second loss, the processing parameter used in the image processing comprises:

acquiring a first weight corresponding to the first loss and a second weight corresponding to the second loss;

obtaining a target loss by weighting the first loss and the second loss based on the first weight and the second weight; and

adjusting, based on the target loss, the processing parameter used in the image processing.

11. The method of any one of claims 1-10, wherein before the acquiring the image sequence to be processed, the method further comprises:

acquiring an image sequence formed by images that are acquired in a preset acquisition period; and

preprocessing the image sequence to obtain the image sequence to be processed.

12. The method of claim 11, wherein preprocessing the image sequence to obtain the image sequence to be processed comprises:

performing direction correction on each image in the image sequence to obtain the image sequence to be processed according to a respective direction identifier of the image in the image sequence.

13. The method of claim 12, wherein preprocessing the image sequence to obtain the image sequence to be processed comprises:

converting the images in the image sequence into images with a preset size; and

obtaining the image sequence to be processed by performing center cropping on the images with the preset size.

14. The method of any one of claims 1-13, wherein the target image is a pelvic computed tomography (CT) image, and the image region comprises one or more of: a left hip bone region, a right hip bone region, a left femur region, a right femur region and a vertebral region.

15. A device for image processing, comprising:

an acquisition module, configured to acquire an image sequence to be processed;

a determination module, configured to obtain a target image sequence section by determining, in the image sequence to be processed, an image sequence section where a target image is located; and

a segmentation module, configured to determine an image region corresponding to at least one image feature class in the target image sequence section by segmenting the target image in the target image sequence section.

16. The device of claim 15, wherein the determination module is configured to:

determine a sampling step length for the image sequence to be processed;

obtain sampled images by acquiring images from the image sequence to be processed according to the sampling step length;

determine a sampled image with a target image feature according to image features of

the sampled images; and

obtain the target image sequence section by determining, according to a position where the sampled image with the target image feature is arranged in the image sequence, the image sequence section where the target image is located.

17. The device of claim 15 or 16, wherein the segmentation module is configured to:

determine the image region corresponding to the at least one image feature class in the target image in the target image sequence section by segmenting the target image in the target image sequence section based on the target image in the target image sequence section and preset relative position information.

18. An electronic device, comprising:

a processor; and

a memory, configured to store processor-executable instructions,

wherein the processor is configured to call the instructions stored in the memory to execute the method of any of claims 1-14.

19. A computer-readable storage medium having computer program instructions stored thereon, wherein the computer program instructions, when being executed by a processor, cause the processor to implement the method of any of claims 1-14.

20. A computer program, comprising a computer-readable code that, when running in an electronic device, enables a processor in the electronic device to execute the method of any of claims 1-14.