Claims

WHAT IS CLAIMED IS:

1. A decoder training method comprising:

acquiring a first face image which is a low-resolution face image with a resolution lower than a first preset value;

decoding the first face image by a decoder to form a high-dimensional vector corresponding to features of the first face image, wherein the high-dimensional vector has a dimension higher than a second preset value;

generating a second face image by a generator according to the high-dimensional vector, wherein the second face image is a high-resolution face image with a resolution higher than a third preset value;

determining the value of loss function according to the similarity between the second face image and the target face image and adjusting parameters of the decoder according to the value of loss function; the preset condition to be met by the value of loss function is that the value of loss function is less than the preset value, and the loss function is determined according to the distance between the features of the generated face image and the features of the target face image;

wherein, the target face image is the first face image or other face image that is the same as or highly similar to the first face image; and

obtaining the well-trained decoder when the value of loss function meets a preset condition.

2. The method according to Claim 1, wherein the loss function is determined according to the distance between the features of the first face image and the features of the second face image.

3. The method according to Claim 2, wherein:

the distance between the features of the first face image and the features of the second

face image is called L2 distance or cos distance;

and the value of the loss function satisfies the preset condition that the value of the loss function is less than the preset value.

4. The method according to Claim 1, wherein the acquiring the first face image involves:

acquiring a third face image whose resolution is higher than the resolution of the first face image;

down-sampling the third face image to obtain the first face image.

5. The method according to Claim 4, wherein the loss function is determined according to the distance between the features of the third face image and the features of the second face image.

6. The method according to Claim 5, wherein:

the distance between the features of the third face image and the features of the second face image is called L2 distance or cos distance;

the value of the loss function satisfies the preset condition that the value of the loss function is less than the preset value.

7. A high-resolution face image generation method, comprising:

acquiring a low-resolution face image to be processed;

inputting the low-resolution face image to be processed to a decoder trained as described in Claims 1-6, and obtaining a high-dimensional vector corresponding to the features of the low-resolution face image to be processed that is output by the decoder; and

generating a high-resolution face image by the generator according to the high-dimensional vector output by the decoder.

8. A decoder training device, comprising:

an input layer designed to input a training image which is a first face image whose resolution is lower than a first preset value;
a decoder designed to decode the training image and obtain a high-dimensional vector corresponding to the features of the training image, which high-dimensional vector has a dimension higher than a second preset value;
an output layer designed to output the training result which is a high-dimensional vector corresponding to the features of the training image;
a generator designed to receive the training result output by the output layer and form a second face image which is a high-resolution face image with a resolution higher than a third preset value;
a loss function value determination module designed to determine the value of loss function;
an adjustment module designed to adjust parameters of the decoder according to the value of the loss function and to obtain the trained decoder when the value of the loss function meets a preset condition.

9. The device according to Claim 8, wherein the loss function value determination module determines the value of the loss function according to the distance between the features of the first face image and the features of the second face image.

10. The device according to Claim 8, further comprising:
a third face image acquisition module designed to acquire a third face image whose resolution is higher than the resolution of the first face image;
a down-sampling module designed to down-sample the third face image to obtain the first face image.

11. The device according to Claim 10, wherein the loss function value determination module of the device determines the value of the loss function according to the distance between the features of the third face image and the features of the second face image.

12. The device according to Claim 9 or Claim 11, further comprising a face recognition module;
wherein the face recognition module is designed to obtain the features of the first face image, the second face image or the third face image.

13. The device according to Claim 12, wherein the face recognition module of the device is a Light_CNN or a FaceNet.

14. A high-resolution face image generation device, comprising:
a low-resolution face image acquisition module designed to acquire a low-resolution face image to be processed;
a decoder which is a decoder trained by the training device described in Claims 8-13;
a generator designed to generate a high-resolution face image according to the high-dimensional vector output by the decoder.

15. A computer device, comprising: at least one processor, a memory, a communication interface and a communication bus, which processor, memory and communication interface communicate with each other through the communication bus; a memory which is coupled to the at least one processor and stores executable instructions that make it possible to realize the method described in Claims 1-6 or Claim 7 when executed by the at least one processor.

16. A chip: a processor designed to call and run a computer program from the memory to further make it possible to implement the method described in Claims 1-6 or Claim 7 by the device on which the chip is installed.

17. A computer-readable storage medium which is characterized in that it stores a computer program which makes it possible to realize the method described in Claims 1-6 or Claim 7 when the computer program is executed by a processor.