CLAIMS

1. An image processing method, comprising:

inputting a to-be-processed image into a neural network; and

forming discrete feature data of the to-be-processed image via the neural network,

wherein the neural network is trained based on guidance information, and during the training process, the neural network is taken as a student neural network; and the guidance information comprises: a difference between discrete feature data formed by a teacher neural network for an image sample and discrete feature data formed by the student neural network for the image sample.

2. The method according to claim 1, wherein the forming discrete feature data of the to-be-processed image via the neural network comprises:

forming floating-point feature data of the to-be-processed image via the neural network, and quantizing the floating-point feature data into the discrete feature data of the to-be-processed image.

3. The method according to claim 2, wherein the forming floating-point feature data of the to-be-processed image via the neural network comprises:

extracting floating-point feature data from the to-be-processed image via the neural network, and converting the extracted floating-point feature data into floating-point feature data satisfying a predetermined requirement to form the floating-point feature data of the to-be-processed image.

4. The method according to claim 3, wherein the converting the extracted floating-point feature data into floating-point feature data satisfying a predetermined requirement comprises at least one of:

converting the floating-point feature data into floating-point feature data with a predetermined number of channels; or

converting the floating-point feature data into floating-point feature data with a predetermined size.

5. The method according to any one of claims 1 to 4, further comprising:

performing corresponding vision task processing on the to-be-processed image via the neural network according to the discrete feature data of the to-be-processed image,

wherein the guidance information further comprises: a difference between a vision task processing result output by the student neural network for the image sample and tagging information of the image sample.

6. The method according to claim 5, wherein the performing corresponding vision task processing on the to-be-processed image via the neural network according to the discrete feature data of the to-be-processed image comprises:

performing classification processing on the to-be-processed image via the neural network according to the discrete feature data of the to-be-processed image; or

performing object detection processing on the to-be-processed image according to the discrete feature data of the to-be-processed image,

wherein the guidance information further comprises:

a difference between a classification processing result output by the student neural network for the image sample and classification tagging information of the image sample; or

a difference between an object detection processing result output by the student neural network for the image sample and detection box tagging information of the image sample.

7. A neural network training method, wherein a to-be-trained neural network is used as a student neural network in a training process, and the training method comprises:

inputting an image sample into a student neural network and a teacher neural network, respectively;

forming discrete feature data of the image sample via the student neural network and the teacher neural network, respectively; and

performing supervised learning on the student neural network according to guidance information,

wherein the guidance information comprises: a difference between discrete feature data formed by the teacher neural network for the image sample and discrete feature data formed by the student neural network for the image sample.

8. The method according to claim 7, wherein the training process of using the neural network as a student neural network further comprises:

performing vision task processing on the image sample via the student neural network according to the discrete feature data of the image sample;

the performing supervised learning on the student neural network according to guidance information comprises:

performing supervised learning on the student neural network by using, as guidance information, the difference between the discrete feature data formed by the teacher neural network for the image sample and the discrete feature data formed by the student neural network for the image sample and a difference between a vision task processing result output by the student neural network and tagging information of the image sample.

9. The method according to either one of claims 7 and 8, wherein the teacher neural network comprises:

a successfully trained floating-point teacher neural network configured to form floating-point feature data for an input image, and perform vision task processing on the input image according to the floating-point feature data; and

a quantization auxiliary unit configured to convert the floating-point feature data formed by the floating-point teacher neural network into discrete feature data, and provide the discrete feature data to the floating-point teacher neural network, so that the floating-point teacher neural network performs vision task processing on the input image according to the discrete feature data.

10. The method according to claim 9, wherein a process of training the teacher neural network comprises:

inputting an image sample into a successfully trained floating-point teacher neural network;

extracting floating-point feature data of the image sample via the successfully trained floating-point teacher neural network, converting the floating-point feature data into discrete feature data via the quantization auxiliary unit, and performing vision task processing on the image sample via the successfully trained floating-point teacher neural network according to the discrete feature data; and

performing network parameter adjustment on the successfully trained floating-point teacher neural network by using a difference between the vision task processing result and tagging information of the image sample as guidance information.

11. The method according to either one of claims 9 and 10, wherein a process of training the floating-point teacher neural network comprises:

inputting an image sample into a to-be-trained floating-point teacher neural network;

extracting floating-point feature data of the image sample via the to-be-trained floating-point teacher neural network, and performing vision task processing on the image sample according to the floating-point feature data; and

performing supervised learning on the to-be-trained floating-point teacher neural network by using a difference between the vision task processing result and tagging information of the image sample as guidance information.

12. An image processing apparatus, comprising:

an image input module configured to input a to-be-processed image into a neural network; and

the neural network configured to form discrete feature data of the to-be-processed image,

wherein the neural network is trained based on guidance information, and during the training process, the neural network is taken as a student neural network; and the guidance information comprises: a difference between discrete feature data formed by a teacher neural network for an image sample and discrete feature data formed by the student neural network for the image sample.

13. The apparatus according to claim 12, wherein the neural network is further configured to:

form floating-point feature data of the to-be-processed image, and quantize the floating-point feature data into the discrete feature data of the to-be-processed image.

14. The apparatus according to claim 13, wherein the neural network is configured to extract floating-point feature data from the to-be-processed image, and convert the extracted floating-point feature data into floating-point feature data satisfying a predetermined requirement to form the floating-point feature data of the to-be-processed image.

15. The apparatus according to claim 14, wherein

the neural network is configured to perform at least one of: converting the floating-point feature data into floating-point feature data with a predetermined number of channels; or

converting the floating-point feature data into floating-point feature data with a predetermined size.

16. The apparatus according to any one of claims 12 to 15, wherein the neural network is further configured to: perform corresponding vision task processing on the to-be-processed image according to the discrete feature data of the to-be-processed image,

wherein the guidance information further comprises: a difference between a vision task processing result output by the student neural network for the image sample and tagging information of the image sample.

17. The apparatus according to claim 16, wherein

the neural network is configured to perform classification processing on the

to-be-processed image according to the discrete feature data of the to-be-processed image; or

the neural network is configured to perform object detection processing on the to-be-processed image according to the discrete feature data of the to-be-processed image,

wherein the guidance information further comprises:

a difference between a classification processing result output by the student neural network for the image sample and classification tagging information of the image sample; or

a difference between an object detection processing result output by the student neural network for the image sample and detection box tagging information of the image sample.

18. A neural network training apparatus, wherein a to-be-trained neural network is used as a student neural network, and the apparatus comprises:

an image sample input module configured to input an image sample into a student neural network and a teacher neural network respectively, to form discrete feature data of the image sample via the student neural network and the teacher neural network respectively; and

a supervision module configured to perform supervised learning on the student neural network according to guidance information,

wherein the guidance information comprises: a difference between discrete feature data formed by the teacher neural network for the image sample and discrete feature data formed by the student neural network for the image sample.

19. An electronic device, comprising:

a memory configured to store a computer program; and

a processor configured to execute the computer program stored in the memory, wherein when the computer program is executed, the method according to any one of claims 1 to 11 is implemented.

20. A computer-readable storage medium having a computer program stored thereon, wherein when the computer program is executed by a processor, the method according to any one of claims 1 to 11 is implemented.