CLAIMS

1. A method for liveness detection, comprising:

acquiring a first image collected by a first image sensor of a binocular camera, and acquiring a second image collected by a second image sensor of the binocular camera;

performing binocular matching processing on the first image and the second image to obtain disparity information between the first image and the second image; and

obtaining a liveness detection result according to the disparity information;

wherein obtaining the liveness detection result according to the disparity information comprises:

training a liveness detection neural network with the disparity information as supervision; and

performing liveness detection by using the trained liveness detection neural network to obtain the liveness detection result;

wherein training the liveness detection neural network with the disparity information as supervision comprises:

performing fusion processing on first liveness feature data extracted from a first target region image and second liveness feature data extracted from a second target region image through the liveness detection neural network to obtain third fused feature data, wherein the first target region image is a target region image of a target object acquired from the first image, and the second target region image is a target region image of the target object acquired from the second image;

determining a network loss based on the third fused feature data and the disparity information; and

adjusting parameters of the liveness detection neural network based on the network loss.

2. The method of claim 1, wherein

a modality of the first image is different from a modality of the second image.

3. The method of claim 1 or 2, wherein performing binocular matching processing on the first image and the second image to obtain the disparity information between the first image and the second image comprises:

obtaining the disparity information between the first image and the second image based on the first target region image and the second target region image.

4. The method of claim 3, wherein acquiring the first target region image of the target object from the first image comprises:

performing key point detection on the first image to obtain first key point information of the target object; and

clipping the first target region image of the target object from the first image based on the first key point information of the target object.

5. The method of any one of claims 3-4, wherein obtaining the disparity information

between the first image and the second image based on the first target region image and the second target region image comprises:

performing feature extraction processing on the first target region image to obtain first feature data, and performing feature extraction processing on the second target region image to obtain second feature data; and

obtaining the disparity information based on the first feature data and the second feature data.

6. The method of claim 5, wherein performing feature extraction processing on the first target region image to obtain the first feature data and performing feature extraction processing on the second target region image to obtain the second feature data comprises:

performing feature extraction on the first target region image by using a first feature extraction subnetwork in a binocular matching neural network to obtain the first feature data, and performing feature extraction on the second target region image by using a second feature extraction subnetwork in the binocular matching neural network to obtain the second feature data.

7. The method of claim 5, wherein performing feature extraction processing on the first target region image to obtain the first feature data and performing feature extraction processing on the second target region image to obtain the second feature data comprises:

performing normalization processing on the first target region image and the second target region image respectively, to enable the normalized first target region image and the normalized second target region image to have a unified distribution;

and

performing feature extraction on the normalized first target region image by using a feature extraction subnetwork in the binocular matching neural network to obtain the first feature data, and performing feature extraction on the normalized second target region image by using the feature extraction subnetwork to obtain the second feature data.

8. The method of any one of claims 1-7, wherein obtaining the liveness detection result according to the disparity information comprises:

obtaining the liveness detection result according to the first target region image acquired from the first image, the second target region image acquired from the second image and the disparity information.

9. The method of claim 8, wherein obtaining the liveness detection result according to the first target region image acquired from the first image, the second target region image acquired from the second image and the disparity information comprises:

performing feature extraction on the disparity information to obtain third liveness feature data;

performing fusion processing on the first liveness feature data extracted from the first target region image, the second liveness feature data extracted from the second target region image and the third liveness feature data to obtain first fused feature data; and

obtaining the liveness detection result based on the first fused feature data.

10. The method of claim 1, wherein performing liveness detection by using the trained liveness detection neural network to obtain the liveness detection result comprises:

performing feature extraction on a third image and fourth image in an image pair to be detected through the trained liveness detection neural network, and performing fusion processing on extracted feature data to obtain second fused feature data; and

processing the second fused feature data through the trained liveness detection neural network to obtain the liveness detection result.

11. The method of any one of claims 1-10, wherein the first image sensor or the second image sensor comprises one of: a visible light sensor, a near infrared sensor and a dual-channel sensor.

12. The method of any one of claims 1-11, wherein the target object is a face.

13. A method for liveness detection, comprising:

acquiring a first image collected by a first image sensor of a binocular camera and a second image collected by a second image sensor of the binocular camera; and

performing liveness detection processing on the first image and the second image through a liveness detection neural network to obtain a liveness detection result, wherein the liveness detection neural network is obtained by training based on disparity information of sample image pairs as supervision;

wherein the liveness detection neural network is trained by:

performing fusion processing on first liveness feature data extracted from a first target region image and second liveness feature data extracted from a second target region image through the liveness detection neural network to obtain third fused feature data, wherein the first target region image is a target region image of a target object acquired from the first image, and the second target region image is a target region image of the target object acquired from the second image;

determining a network loss based on the third fused feature data and the disparity information; and

adjusting parameters of the liveness detection neural network based on the network loss.

14. The method of claim 13, wherein performing liveness detection processing on the first image and the second image through the liveness detection neural network to obtain the liveness detection result comprises:

performing liveness detection processing by inputting the first image and the second image to the liveness detection neural network to obtain the liveness detection result, the first image and the second image being face images.

15. The method of claim 13, wherein performing liveness detection processing on the first image and the second image through the liveness detection neural network to obtain the liveness detection result comprises:

performing liveness detection processing by inputting the first target region image and the second target region image to the liveness detection neural network to obtain the liveness detection result.

16. A device for liveness detection comprising a processor and a memory, wherein the memory is configured to store computer program codes, and the processor is

configured to call the computer program codes to execute the method of any one of claims 1-12.

17. A device for liveness detection comprising a processor and a memory, wherein the memory is configured to store computer program codes, and the processor is configured to call the computer program codes to execute the method of any one of claims 13-15.

18. A computer-readable storage medium having stored computer-readable instructions that when called by a processor, enable the processor to execute the method of any one of claims 1-12.

19. A computer-readable storage medium having stored computer-readable instructions that when called by a processor, enable the processor to execute the method of any one of claims 13-15.