WHAT IS CLAIMED IS:

1. A method for liveness detection, comprising:

performing feature extraction on a collected image to obtain image feature information;

determining a modality classification result of the image based on the image feature information, wherein the modality classification result indicates that the image corresponds to a target modality in at least one modality; and

determining whether a target object in the image is living based on the modality classification result of the image.

2. The method according to claim 1, wherein determining the modality classification result of the image based on the image feature information comprises:

performing classification processing based on the image feature information to obtain a classification probability that the image belongs to each of the at least one modality; and

determining the target modality to which the image belongs based on the classification probability that the image belongs to each of the at least one modality.

3. The method according to claim 1 or 2, wherein determining whether the target object in the image is living based on the modality classification result of the image comprises:

determining whether the target object in the image is living based on the modality classification result of the image and the image feature information.

4. The method according to claim 3, wherein determining whether the target object in the image is living based on the modality classification result of the image and the image feature information comprises:

merging the image feature information with the modality classification result of the image to obtain a merging result; and

determining whether the target object in the image is living based on the merging result.

5. The method according to claim 3, wherein determining whether the target object in the image

is living based on the modality classification result of the image and the image feature information comprises:

obtaining an authenticity prediction probability corresponding to each of the at least one modality based on the image feature information; and

determining whether the target object in the image is living based on the modality classification result and the authenticity prediction probability corresponding to each of the at least one modality.

6. The method according to claim 5, wherein the modality classification result comprises the classification probability that the image belongs to each of the at least one modality; and

determining whether the target object in the image is living based on the modality classification result and the authenticity prediction probability corresponding to each of the at least one modality comprises:

performing weighted sum on the authenticity prediction probabilities of all the at least one modality by taking the classification probability of each modality as a weight value corresponding to the each modality, so as to obtain a target authenticity prediction probability; and

determining whether the target object in the image is living based on the target authenticity prediction probability.

7. The method according to claim 5, wherein determining whether the target object in the image is living based on the modality classification result and the authenticity prediction probability corresponding to each of the at least one modality comprises:

determining a target authenticity prediction probability from the at least one authenticity prediction probability based on the classification probability corresponding to each of the at least one modality comprised in the modality classification result; and

determining whether the target object in the image is living based on the target authenticity prediction probability.

8. The method according to claim 7, wherein determining the target authenticity prediction probability from the at least one authenticity prediction probability based on the classification

probability corresponding to each of the at least one modality comprised in the modality classification result comprises:

in response to presence of a classification probability greater than or equal to a predetermined probability in the at least one classification probability comprised in the modality classification result, determining a modality corresponding to the classification probability greater than or equal to the predetermined probability as the target modality, and determining an authenticity prediction probability of the target modality as the target authenticity prediction probability.

9. The method according to any one of claims 1 to 8, before performing feature extraction on the collected image to obtain the image feature information, further comprising:

performing image acquisition by means of a dual-channel camera to obtain the image.

10. The method according to claim 9, wherein the at least one modality comprises: a dual-channel modality and an RGB modality.

11. The method according to any one of claims 1 to 10, wherein the method is implemented by using a liveness detection network, and

before performing feature extraction on the collected image to obtain the image feature information, the method further comprises:

training an initial liveness detection network based on a sample data set to obtain the liveness detection network, wherein the sample data set comprises sample images of at least two modalities.

12. A method for liveness detection, comprising:

obtaining an image of a first modality; and

performing liveness detection on the image by means of a liveness detection network to determine whether a target object in the image is living, wherein the liveness detection network is obtained by training an initial liveness detection network based on a sample image set, and the sample image set comprises a sample image of the first modality and a sample image of a second modality.

13. The method according to claim 12, wherein the performing liveness detection on the image by means of a liveness detection network to determine whether a target object in the image is living comprises:

performing feature extraction on the image by means of the liveness detection network to obtain image feature information; and

determining whether the target object in the image is living by means of the liveness detection network based on the image feature information.

14. The method according to claim 12 or 13, wherein the method further comprises:

performing feature extraction on a sample image in the sample image set to obtain sample feature information;

determining a sample modality classification result of the sample image based on the sample feature information, the sample modality classification result indicating that the sample image corresponds to a sample modality in at least one modality;

determining an authenticity prediction result of the sample image based on the sample modality classification result; and

adjusting network parameters of the initial liveness detection network based on the authenticity prediction result and tagged authenticity information of the sample image.

15. The method according to claim 14, wherein determining the sample modality classification result of the sample image based on the sample feature information comprises:

determining, based on the sample feature information, a classification probability that the sample image belongs to the first modality and a classification probability that the sample image belongs to the second modality; and

determining a sample modality to which the sample image belongs based on the classification probability that the sample image belongs to the first modality and the classification probability that the sample image belongs to the second modality.

16. The method according to claim 14 or 15, wherein determining the authenticity prediction result of the sample image based on the sample modality classification result comprises:

determining the authenticity prediction result of the sample image based on the sample modality classification result and the sample feature information.

17. The method according to claim 16, wherein determining the authenticity prediction result of the sample image based on the sample modality classification result and the sample feature information comprises:

merging the sample feature information with the sample modality classification result of the sample image to obtain a sample merging result; and

determining the authenticity prediction result of the sample image based on the sample merging result.

18. The method according to any one of claims 12 to 17, wherein the first modality is a near-infrared modality, and the second modality is an RGB modality.

19. An apparatus for liveness detection, comprising:

a feature extraction unit, configured to perform feature extraction on a collected image to obtain image feature information;

a modality classification unit, configured to determine a modality classification result of the image based on the image feature information, wherein the modality classification result indicates that the image corresponds to a target modality in at least one modality; and

a liveness detection unit, configured to determine whether a target object in the image is living based on the modality classification result of the image.

20. The apparatus according to claim 19, wherein the modality classification unit is configured to:

perform classification processing based on the image feature information to obtain a classification probability that the image belongs to each of the at least one modality; and

determine the target modality to which the image belongs based on the classification probability that the image belongs to each of the at least one modality.

21. The apparatus according to claim 19 or 20, wherein the liveness detection unit is configured

to determine whether the target object in the image is living based on the modality classification result of the image and the image feature information.

22. The apparatus according to claim 21, wherein the liveness detection unit is configured to:

merge the image feature information with the modality classification result of the image to obtain a merging result; and

determine whether the target object in the image is living based on the merging result.

23. The apparatus according to claim 21, wherein the liveness detection unit comprises:

an authenticity prediction probability module, configured to obtain an authenticity prediction probability corresponding to each of the at least one modality based on the image feature information; and

a result determination module, configured to determine whether the target object in the image is living based on the modality classification result and the authenticity prediction probability corresponding to each of the at least one modality.

24. The apparatus according to claim 23, wherein the modality classification result comprises the classification probability that the image belongs to each of the at least one modality; and

the result determination module is configured to perform weighted sum on the authenticity prediction probabilities of all the at least one modality by taking the classification probability that the image belongs to each modality as a weight value corresponding to the each modality, so as to obtain a target authenticity prediction probability, and determine whether the target object in the image is living based on the target authenticity prediction probability.

25. The apparatus according to claim 23, wherein the result determination module being configured to determine whether the target object in the image is living based on the modality classification result and the authenticity prediction probability corresponding to each of the at least one modality comprises:

the result determination module determines a target authenticity prediction probability from the at least one authenticity prediction probability based on the classification probability corresponding to each of the at least one modality comprised in the modality classification result;

and

the result determination module determines whether the target object in the image is living based on the target authenticity prediction probability.

26. The apparatus according to claim 25, wherein the result determination module being configured to determine a target authenticity prediction probability from the at least one authenticity prediction probability based on the classification probability corresponding to each of the at least one modality comprised in the modality classification result comprises:

in response to presence of a classification probability greater than or equal to a predetermined probability in the at least one classification probability comprised in the modality classification result, the result determination module determines a modality corresponding to the classification probability greater than or equal to the predetermined probability as the target modality, and determines an authenticity prediction probability of the target modality as the target authenticity prediction probability.

27. The apparatus according to any one of claims 19 to 26, further comprising:

an image acquisition unit, configured to perform image acquisition by means of a dual-channel camera to obtain the image.

28. The apparatus according to claim 27, wherein the at least one modality comprises: a dual-channel modality and an RGB modality.

29. The apparatus according to any one of claims 19 to 28, wherein the apparatus is implemented by using a liveness detection network, and

the apparatus further comprises:

a network training unit, configured to train an initial liveness detection network based on a sample data set to obtain the liveness detection network, wherein the sample data set comprises sample images of at least two modalities.

30. An apparatus for liveness detection, comprising:

an image acquisition unit, configured to obtain an image of a first modality; and

a target detection unit, configured to perform liveness detection on the image by means of a liveness detection network to determine whether a target object in the image is living, wherein the liveness detection network is obtained by training an initial liveness detection network based on a sample image set, and the sample image set comprises a sample image of the first modality and a sample image of a second modality.

31. The apparatus according to claim 30, wherein the target detection unit is configured to perform feature extraction on the image by means of the liveness detection network to obtain image feature information, and determine whether the target object in the image is living by means of the liveness detection network based on the image feature information.

32. The apparatus according to claim 30 or 31, further comprising:

a detection network training unit, configured to: perform feature extraction on a sample image in the sample image set to obtain sample feature information; determine a sample modality classification result of the sample image based on the sample feature information, the sample modality classification result indicating that the sample image corresponds to a sample modality in at least one modality; determine an authenticity prediction result of the sample image based on the sample modality classification result; and adjust network parameters of the initial liveness detection network based on the authenticity prediction result and tagged authenticity information of the sample image.

33. The apparatus according to claim 32, wherein during determining the sample modality classification result of the sample image based on the sample feature information, the detection network training unit is configured to determine, based on the sample feature information, a classification probability that the sample image belongs to the first modality and a classification probability that the sample image belongs to the second modality; and determine a sample modality to which the sample image belongs based on the classification probability that the sample image belongs to the first modality and the classification probability that the sample image belongs to the second modality.

34. The apparatus according to claim 31 or 32, wherein during determining the authenticity

prediction result of the sample image based on the sample modality classification result, he detection network training unit is configured to determine the authenticity prediction result of the sample image based on the sample modality classification result and the sample feature information.

35. The apparatus according to claim 34, wherein during determining the authenticity prediction result of the sample image based on the sample modality classification result and the sample feature information, the detection network training unit is configured to merge the sample feature information with the sample modality classification result of the sample image to obtain a sample merging result, and determine the authenticity prediction result of the sample image based on the sample merging result.

36. The apparatus according to any one of claims 30 to 35, wherein the first modality is a near-infrared modality, and the second modality is an RGB modality.

37. An electronic device, comprising a processor, wherein the processor comprises the apparatus for liveness detection according to any one of claims 19 to 29 or the apparatus for liveness detection according to any one of claims 30 to 36.

38. An electronic device, comprising:

a memory, configured to store executable instructions; and

a processor, configured to communicate with the memory to execute the executable instructions so as to perform operations of the method for liveness detection according to any one of claims 1 to 11 or the method for liveness detection according to any one of claims 12 to 18.

39. A computer readable storage medium for storing computer readable instructions, wherein when the instructions are executed, operations of the method for liveness detection according to any one of claims 1 to 11 or the method for liveness detection according to any one of claims 12 to 18 are executed.

40. A computer program product, comprising computer readable codes, wherein when the computer readable codes run in a device, the processor in the device executes the instructions for implementing the method for liveness detection according to any one of claims 1 to 11 or the method for liveness detection according to any one of claims 12 to 18.