

CLAIMS

1. A method for detecting a living body, comprising:

acquiring a first image captured by a first camera, and performing face detection processing on the first image;

acquiring a second image captured by a second camera responsive to detecting that the first image comprises a face, ~~wherein~~ the first camera and the second camera ~~are being~~ different types of cameras, and re-executing acquisition of the first image captured by the first camera responsive to detecting that the first image comprises no face; and

performing face detection processing on the second image, and obtaining, responsive to detecting that the second image comprises a face, a living-body detection result based on a matching result of the face in the first image and the face in the second image,

wherein obtaining the living-body detection result based on the matching result of the face in the first image and the face in the second image comprises:

acquiring a first sub image corresponding to a face meeting a preset condition in the first image;

comparing the first sub image and second sub images corresponding to faces detected in the second image to determine a second sub image matched with the first sub image; and

inputting the first sub image and the second sub image matched with the first sub image to a living-body detection neural network to obtain a living-body detection result of the face in the first sub image.

2. The method of claim 1, wherein acquiring the second image collected by the second camera comprises at least one of the following manners:

acquiring the second image captured by the second camera in a case that the first image captured by the first camera is acquired; or

acquiring the second image captured by the second camera in a case of detecting that the first image comprises the face.

3. The method of claim 1 or 2, further comprising:

determining that the face in the first image is a non-living body responsive to detecting that the second image comprises no face.

~~4. The method of any one of claims 1-3, wherein obtaining the living-body detection result based on the matching result of the face in the first image and the face in the second image comprises:~~

~~acquiring a first sub image corresponding to a face meeting a preset condition in the first image;~~

~~comparing the first sub image and second sub images corresponding to faces detected in the second image to determine a second sub image matched with the first sub image; and~~

~~inputting the first sub image and the second sub image matched with the first sub image to a living-body detection neural network to obtain a living-body detection result of the face in the first sub image.~~

~~54.~~ The method of claim ~~43~~, wherein acquiring the first sub image corresponding to the face meeting the preset condition in the first image comprises:

obtaining a first sub image corresponding to a face having a largest area based on position information of faces in the first image.

65. The method of claim ~~4 or 53~~ or 4, wherein comparing the first sub image and the second sub images corresponding to the faces detected in the second image to determine the second sub image matched with the first sub image comprises:

performing feature extraction on the first sub image and the second sub images to obtain a first face feature of the first sub image and second face features of the second sub images;

obtaining similarities between the first face feature and the second face features; and

in condition that there is at least one second face feature whose similarity to the first face feature is greater than a first threshold, determining that a second sub image corresponding to a second face feature with a highest similarity to the first face feature is matched with the first sub image corresponding to the first face feature.

76. The method of claim ~~4 or 53~~ or 4, wherein comparing the first sub image and the second sub images corresponding to the faces detected in the second image to determine the second sub image matched with the first sub image comprises:

acquiring distances between a first position of the first sub image in the first image and second positions of the second sub images in the second image; and

in condition that a distance between a second position of any of the second sub images and the first position of the first sub image is less than a distance threshold, determining that the second sub image is matched with the first sub image.

87. The method of any one of claims ~~4-73~~-6, wherein obtaining the living-body detection result based on the matching result of the face in the first image and the face in the second image responsive to detecting that the second image comprises the face further comprises:

responsive to detecting that the second image comprises no second sub image matched

with the first sub image, re-executing the method for detecting the living body.

98. The method of claim 87, further comprising:

in condition that a count of re-executing the method for detecting the living body exceeds a count threshold, determining that the living-body detection result is a nonliving body.

~~10. The method of any one of claims 1-9, further comprising:~~

~~re-executing acquisition of the first image captured by the first camera responsive to detecting that the first image comprises no face.~~

119. The method of any one of claims ~~1-10~~1-8, wherein the first camera is a Red-Green-Blue (RGB) camera, and the second camera is an Infrared Radiation (IR) camera.

~~12~~10. A device for detecting a living body, comprising:

a first detection module, configured to acquire a first image captured by a first camera and perform face detection processing on the first image;

an acquisition module, configured to acquire a second image captured by a second camera responsive to detecting that the first image comprises a face, wherein the first camera and the second camera are different types of cameras; and

a second detection module, configured to perform face detection processing on the second image, and obtain, responsive to detecting that the second image comprises a face, a living-body detection result based on a matching result of the face in the first image and the face in the second image.

wherein the first detection module is further configured to re-execute acquisition of the

first image captured by the first camera responsive to detecting that the first image comprises no face, and

wherein the second detection module further comprises:

an acquisition unit, configured to acquire a first sub image corresponding to a face meeting a preset condition in the first image;

a matching unit, configured to compare the first sub image and second sub images corresponding to faces detected in the second image to determine a second sub image matched with the first sub image; and

a living-body detection unit, configured to input the first sub image and the second sub image matched with the first sub image to a living-body detection neural network to obtain a living-body detection result of the face in the first sub image..

1311. The device of claim 1210, wherein the acquisition module is configured to acquire the second image captured by the second camera in at least one of the following manners:

acquiring the second image captured by the second camera in a case that the first image is captured by the first camera; and

acquiring the second image captured by the second camera in a case of detecting that the first image comprises the face.

1412. The device of claim ~~12 or 13~~10 or 11, wherein the second detection module is further configured to determine that the face in the first image is a non-living body responsive to detecting that the second image comprises no face.

~~15. The device of any one of claims 12-14, wherein the second detection module further~~

comprises:

~~an acquisition unit, configured to acquire a first sub image corresponding to a face meeting a preset condition in the first image;~~

~~a matching unit, configured to compare the first sub image and second sub images corresponding to faces detected in the second image to determine a second sub image matched with the first sub image; and~~

~~a living-body detection unit, configured to input the first sub image and the second sub image matched with the first sub image to a living-body detection neural network to obtain a living-body detection result of the face in the first sub image.~~

~~1613.~~ The device of claim ~~1512~~, wherein the acquisition unit is further configured to obtain a first sub image corresponding to a face having a largest area based on position information of faces in the first image.

~~1714.~~ The device of claim ~~15 or 1612 or 13~~, wherein the matching unit is further configured to:

perform feature extraction on the first sub image and the second sub images to obtain a first face feature of the first sub image and second face features of the second sub images;

obtain similarities between the first face feature and the second face features, and

in a case that there is at least one second face feature whose similarity to the first face feature is greater than a first threshold, determine that a second sub image corresponding to a second face feature with a highest similarity to the first face feature is matched with the first sub image corresponding to the first face feature.

~~1815.~~ The device of claim ~~15 or 1612 or 13~~, wherein the matching unit is further configured to:

acquire distances between a first position of the first sub image in the first image and second positions of the second sub images in the second image, and

in condition that a distance between the second position of any of the second sub images and the first position of the first sub image is less than a distance threshold, determine that the second sub image is matched with the first sub image.

~~19~~16. The device of any one of claims ~~15-18~~12-15, wherein the matching unit is further configured to, in condition that the second image comprises no second sub image matched with the first sub image, re-execute acquisition of the first image and performing living-body detection.

~~20~~17. The device of claim ~~19~~16, wherein the matching unit is further configured to determine that the living detection result is a non-living body in condition that a count of re-executing the living-body detection exceeds a count threshold.

~~21. The device of any one of claims 12-20, wherein the first detection module is further configured to re-execute acquisition of the first image captured by the first camera responsive to detecting that the first image comprises no face.~~

~~22~~18. The device of any one of claims ~~12-21~~10-17, wherein the first camera is a Red-Green-Blue (RGB) camera, and the second camera is an Infrared Radiation (IR) camera.

~~23~~19. An electronic device, comprising:

a processor; and

a memory configured to store instructions executable by the processor,

wherein the processor is configured to execute the instructions stored in the memory to implement the method of any one of claims ~~1-11~~1-9.

~~24~~20. A computer-readable storage medium, having stored therein computer program instructions, wherein the computer program instructions, when being executed by a processor, cause the processor to implement the method of any one of claims ~~1-11~~1-9.