

[CLAIMS]

1. A method of verifying a certificate and a certificate holder, characterized by comprising the steps of:

acquiring a video of the certificate with a specified series of projection angles in real time;

extracting image features of the certificate under different projection angles in the video;

verifying authenticity of the certificate according to the image features of the certificate;

acquiring a human face video in real time;

verifying whether it is a real person in the human face video;

extracting image features of the human face in the human face video; and

when the certificate is verified to be authentic and it is a real person in the human face video, comparing the image features of the certificate with the image features of the human face in the human face video, to determine whether the certificate holder is the owner of the certificate.

wherein the image features of the certificate comprise a visual anti-counterfeiting feature of the certificate, the visual anti-counterfeiting feature includes a dynamic visual anti-counterfeiting feature that changes with the projection angles, the authenticity of the certificate is verified according to the dynamic visual anti-counterfeiting feature.

2. The method of verifying a certificate and a certificate holder according to claim 1, characterized in that

the video of the certificate with the specified series of projection angles and the human face video is acquired from a video of which the certificate holder holds the certificate and performs a specified series of actions, wherein the specified series of actions enables the certificate to have the specified series of projection angles.

3. The method of verifying a certificate and a certificate holder according to claim 1, characterized by further comprising:

verifying whether the video acquisition of the certificate under the specified series of projection angles is finished or not according to the image features of the certificate

under different projection angles.

4. The method of verifying a certificate and a certificate holder according to claim 1, characterized in that the step of extracting image features of the certificate under different projection angles in the video comprises the following substeps:

- splitting the video into a plurality of pictures by frames;
- extracting image features of the certificate in each of the plurality of pictures;
- calculating a projection angle of each picture according to a position of the certificate in each of the plurality of pictures; and
- recording the image features of the certificate in each of the plurality of pictures and the projection angle of the corresponding picture.

5. The method of verifying a certificate and a certificate holder according to claim 1, characterized in that

the image features of the certificate further comprise ~~a visual anti-counterfeiting feature of the certificate and~~ image features of the human face in the certificate,
~~the authenticity of the certificate is verified according to the visual anti-counterfeiting feature of the certificate, and~~

the image features of the human face in the certificate is compared with the image features of the human face in the human face video, to determine whether the certificate holder is the owner of certificate.

~~6. The method of verifying a certificate and a certificate holder according to claim 5, characterized in that~~

~~the visual anti-counterfeiting feature includes a dynamic visual anti-counterfeiting feature that changes with the projection angles.~~

~~7~~6. An apparatus for verifying a certificate and a certificate holder, comprising:

- a first video acquiring module for acquiring a video of the certificate with a specified series of projection angles in real time;
- a first extracting module for extracting image features of the certificate under different projection angles in the video;
- a first verifying module for verifying authenticity of the certificate according to the

image features of the certificate;

a second video acquiring module for acquiring a human face video in real time;

a second verifying module for verifying whether it is a real person in the human face video;

a second extracting module for extracting image features of the human face in the human face video; and

a comparing module for, when the certificate is verified to be authentic and it is a real person in the human face video, comparing the image features of the certificate with the image features of the human face in the human face video, to determine whether the certificate holder is the owner of the certificate₂.

wherein the image features of the certificate comprise a visual anti-counterfeiting feature of the certificate, the visual anti-counterfeiting feature includes a dynamic visual anti-counterfeiting feature that changes with the projection angles, the first verifying module verifies the authenticity of the certificate according to the dynamic visual anti-counterfeiting feature.

87. The apparatus for verifying a certificate and a certificate holder according to claim **76**, characterized in that

the first video acquiring module and the second video acquiring module acquire the video of the certificate with the specified series of projection angles and the human face video respectively, from a video of which the certificate holder holds the certificate and performs a specified series of actions, wherein the specified series of actions enables the certificate to have the specified series of projection angles.

98. The apparatus for verifying a certificate and a certificate holder according to claim **76**, characterized by further comprising:

a third verifying module for verifying whether the video acquisition of the certificate under the specified series of projection angles is finished or not according to the image features of the certificate under different projection angles.

109. The apparatus for verifying a certificate and a certificate holder according to claim **76**, characterized in that the first extracting module comprises:

a splitting submodule for splitting the video into a plurality of pictures by frames;

a first extracting submodule for extracting image features of the certificate in each of the plurality of pictures;

a first processing submodule for calculating a projection angle of each picture according to a position of the certificate in each of the plurality of pictures; and

a recording submodule for recording the image features of the certificate in each of the plurality of pictures and the projection angle of the corresponding picture.

~~11~~10. The apparatus for verifying a certificate and a certificate holder according to claim ~~7~~6, characterized in that

the image features of the certificate further comprise ~~a visual anti-counterfeiting feature of the certificate and~~ image features of the human face in the certificate,

~~the first verifying module verifies the authenticity of the certificate according to the visual anti-counterfeiting feature of the certificate, and~~

the comparing module compares the image features of the human face in the certificate with the image features of the human face in the human face video, to determine whether the certificate holder is the owner of certificate.

~~12. The apparatus for verifying a certificate and a certificate holder according to claim 11, characterized in that~~

~~the visual anti-counterfeiting feature includes a dynamic visual anti-counterfeiting feature that changes with the projection angles.~~

~~13~~11. A computer-readable storage medium on which a computer program is stored, wherein when the program is executed by a processor, causes the processor to:

acquire a video of the certificate with a specified series of projection angles in real time;

extract image features of the certificate under different projection angles in the video;

verify authenticity of the certificate according to the image features of the certificate;

acquire a human face video in real time;

verify whether it is a real person in the human face video;

extract image features of the human face in the human face video; and

when the certificate is verified to be authentic and it is a real person in the human face video, compare the image features of the certificate with the image features of the human face in the human face video, to determine whether the certificate holder is the owner of the certificate,

wherein the image features of the certificate comprise a visual anti-counterfeiting feature of the certificate, the visual anti-counterfeiting feature includes a dynamic visual anti-counterfeiting feature that changes with the projection angles, the authenticity of the certificate is verified according to the dynamic visual anti-counterfeiting feature.