

METHOD AND APPARATUS FOR USER AUTHENTICATION

The present application claims the priority of the Chinese patent application No. 2010101104226 filed with the Chinese Intellectual Property Office on February 2, 2010, the entire contents of which is incorporated herein by reference.

Field of the invention

The present invention relates to a method and apparatus for user authentication, belongs to network communication technology.

10 Background art

At present, methods for user authentication are artificial audit, and auditors have heavy workload, it may take several days for some legitimate users to pass authentication, which brings inconvenience to the users.

Summary

15 The present invention provides a method and apparatus for user authentication, to solve the problems of artificial discrimination being slow and user waiting for a long time for authentication in the existing technology, for this, the present invention uses the following technical solutions:

The present invention provides a method for user authentication, includes:

20 identifying saved photographs of an identical user according to a predetermined template, if they meet a predetermined requirement, then sending a plurality of saved photographs of the user which are randomly selected to a plurality of designated users for judging or giving scores;

if more than a predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, or if more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are randomly selected according to a

specific standard scores greater than or equal to a specific value, then the user is authenticated as legal;

if they do not meet the predetermined requirement, or more than the predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are not photographs of the identical user, or more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are randomly selected according to the specific standard scores less than the specific value, then the user is authenticated as illegal.

The present invention also provides an apparatus for user authentication, includes:

a predetermined template identification unit, configured to identify saved photographs of an identical user according to a predetermined template, if they meet a predetermined requirement, then a random sending unit is performed; if they do not meet the predetermined requirement, then the user is authenticated as illegal;

the random sending unit, configured to randomly select a plurality of saved photographs of the user and send the plurality of saved photographs of the user which are randomly selected to a plurality of designated users for judging or giving scores;

a receiving authentication unit, configured to receive a judgment result or score response of the designated users sent by the random sending unit, if more than a predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, or if more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are randomly selected scores greater than or equal to a specific value according to a specific standard, then the user is authenticated as legal, if more than the predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are not photographs of the identical user, or if more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are randomly selected scores less than a specific value according to the specific standard, then the user is authenticated as illegal.

The technical solution provided in the present invention can simplify the work process of the staff, increase the speed of user authentication and meet the needs of the

users through the preliminary screening of the predetermined template and the designated user's filtering of the qualified users of the preliminary screening.

Brief description of the drawings

5 In order to more clearly illustrate technical solutions of embodiments of the invention, the figures which are needed to be used in the description of the embodiments will be briefly described in the following. Obviously, the figures in the following description are only some embodiments of the invention, and it is easily for those skilled in the art to obtain other figures based on the following figures without creative work.

10 Fig. 1 is a flow chart of a method for user authentication of one embodiment of the present invention;

Figs. 2a-2b show schematic diagrams of predetermined templates which can be selected in a method for user authentication of one embodiment of the present invention;

Fig. 3 is a flow chart of an exemplary illustrated method for user authentication of one embodiment of the present invention;

15 Fig. 4 is a schematic diagram of an apparatus for user authentication of one embodiment of the present invention.

Detailed description of examples

20 The embodiments of the present invention are hereinafter further explained in details with reference to drawings. The description mainly takes an application of the present invention in instant messaging service as the best embodiment; of course, in the actual applications, the present invention can also be applied in a webmail service system, network collaborative work service system or other internet service systems.

A method for user authentication provided in one embodiment of the invention, as shown in Fig. 1, can specifically include the following steps:

25 Step 11: saved photographs of an identical user are identified according to a predetermined template, if they meet a predetermined requirement, then step 12 is performed; if they do not meet the predetermined requirement, then step 16 is performed;

Step 12: a plurality of saved photographs of the user are randomly selected and sent

to a plurality of designated users, and then step 13 or step 14 is performed;

Step 13: it is determined whether more than the predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, if yes, step 15 is performed, if
5 not, step 16 is performed;

Step 14: it is determined whether more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are randomly selected scores greater than or equal to a specific value according to a specific standard, if yes, then step 15 is performed, if not, then step 16 is performed;

10 Step 15: the user is authenticated as legal;

Step 16: the user is authenticated as illegal.

In the above method, after the user is authenticated as illegal, the plurality of saved photographs of the user which are randomly selected, can be sent to the staff for one more audit, if the audit result is still disqualified, then the user is notified that the authentication
15 is illegal, if the audit result is legal, then the user is authenticated as legal. The predetermined template takes a rectangle as a feature vector of the face detection, and uses color values in the rectangle to distinguish feature areas in the photograph. The predetermined requirement means that feature areas of photographs of the predetermined template are set according to the color values of the face. For example, an eigenvalue of
20 the feature vector can be defined as: a sum of white rectangle pigments minus a sum of black rectangle pigments, the eye part is darker than the cheek part, two sides of the bridge of the nose are darker than the bridge of the nose, the mouth is darker than the surrounding part, then the black part of the rectangle in Fig. 2(a) can be placed in the eye part or mouth part of the person in the photograph, and the white part of the rectangle in
25 Fig. 2(b) can be placed in the bridge of the nose of the person in the photograph. Other templates which can identify faces can also be used, as long as characteristic parts of the person can be identified.

In the above method, before step 11, a plurality of photographs of the user can be continuously shot by a video and saved, or a plurality of photographs sent by the user are
30 received and then saved.

Further, the specific standard, the predetermined number and the specific value are

determined according to the safety degree required by the authentication, the corresponding specific standard can specifically include: not being a cartoon head portrait, star head portrait or children head portrait, not being a photograph of many persons, face having no shelter or not being incomplete, not being a lateral head portrait and so on. For example, if the safety degree required by the authentication is lower, then the specific standard can only be: not being a cartoon head portrait, star head portrait or children head portrait; the predetermined number can be set to three or more persons, the specific value can only be set to 60 points or more (total score 100 points); if the safety degree required by the authentication is very high, then the specific standard needs to be set to: not being a cartoon head portrait, star head portrait or children head portrait, and not being a photograph of many persons, face having no shelter or not being incomplete, not being a lateral head portrait and so on; the predetermined number needs to be set to ten or more, the specific value needs to be set to 70 points or more (total score 100 points).

The designated multiple users can be picked from high level users or users having strong sense of responsibility by the authentication apparatus or the staff according to user's identity information, for example, one user's level is primary but he can report some irregularities user or actively helps other users, then this user can be designated, or one user's level is senior and he has been operating according to instructions, then this user can also be designated; the designated multiple users can also be determined according to their relationship with the user to be authenticated, for example, a total number of friends which are of the user to be authenticated and which can be designated is less than one half of the designate users, for example, six users are designated in total, then friends of the user to be authenticated cannot be more than 3 persons, can only be 2 persons or 1 person, increasing friends of the user to be authenticated to authenticate can clearly understand whether the user's photographs are his own, and less than half can guarantee the fairness of the authentication.

In combination with the above method, as shown in Fig. 3, the whole process of the user authentication is specifically illustrated with an example.

Step 31: a plurality of photographs of an identical user are continuously shot by a video and saved, or a plurality of photographs sent by the user are received and then saved;

Step 32: it is determined whether the saved photographs of the identical user are

personal face according to a predetermined template, if yes, then step 33 is performed, if not, step 36 is performed;

Step 33: a plurality of photographs of the user saved in step 31 are randomly selected and sent to a plurality of designated users for judging or giving scores;

5 Step 34: a judgment result or score response of the designated users is received, and it is determined whether more than a predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, or it is determined whether more than the predetermined number of the designated users give for the plurality of saved photographs of the user
10 which are randomly selected according to a specific standard scores greater than or equal to a specific value, if yes, then step 35 is performed; if not, then step 36 is performed;

Step 35: the user is authenticated as legal;

Step 36: the user is authenticated as illegal.

15 In the above method, after the user is authenticated as illegal, the plurality of saved photographs of the user which are randomly selected, can be sent to the staff for one more audit, if the audit result is still disqualified, then the user is notified that the authentication is illegal, if the audit result is legal, then the user is authenticated as legal.

20 The technical solution provided in this embodiment can simplify the workload of the audit staff; the preliminary screening carried through the determination of whether saved photographs of an identical user meet the predetermined requirement according to a predetermined template, can mainly authenticate an obviously not qualified user as illegal through the face recognition technology and then notify the staff; and then, through the designated users' user distinguishing process of a plurality of saved photographs of the user which are randomly selected or designated users' user scoring process of a plurality
25 of saved photographs of the user which are randomly selected, and through a judging process of whether more than a predetermined number of designated users judge that they are photographs of the identical user in the user distinguishing process or whether more than a predetermined number of designated users give scores larger than or equal to a specific value in the scoring process, some star head portraits, cartoon head portraits or
30 children head portraits are screened out and are notified to administrators; finally, after the staff audits photos of reported some controversial users, user authentication can be

achieved. This simplifies the workload of the staff; the cost of the audit can be saved through the preliminary screening, the user distinguishing or scoring process, and users to be authenticated are provided with convenient; safety and accuracy of user authentication can be guaranteed, so that legally authenticated user can pass the authentication in the shortest time, which increases the speed of user authentication and meets the needs of the users.

One embodiment of the present invention also provides a technical solution of an apparatus for user authentication, as shown in Fig. 4, the apparatus includes:

a predetermined template identification unit 41, configured to identify saved photographs of an identical user according to a predetermined template, if they meet a predetermined requirement, then a random sending unit 42 is performed; if they do not meet the predetermined requirement, then the user is authenticated as illegal;

the random sending unit 42, configured to randomly select a plurality of saved photographs of the user and sent the plurality of saved photographs of the user which are randomly selected to a plurality of designated users for judging or giving scores;

a receiving authentication unit 43, configured to receive a judgment result or score response of the designated users sent by the random sending unit 42, if more than a predetermined number of designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, or if more than a predetermined number of designated users give for the plurality of saved photographs of the user which are randomly selected according to a specific standard scores greater than or equal to a specific value, then the user is authenticated as legal, if more than a predetermined number of designated users judge that the plurality of saved photographs of the user which are randomly selected, are not photographs of the identical user, or if more than a predetermined number of designated users give for the plurality of saved photographs of the user which are randomly selected according to a specific standard scores less than a specific value, then the user is authenticated as illegal.

The above apparatus can also include:

a storage unit, configured to save a plurality of photographs of the user which are continuously shot by a video, or save the received a plurality of photographs of the user.

The predetermined template identification unit 41 is configured to identify a

plurality of photographs of an identical user saved in the storage unit according to a predetermined template, if they meet a predetermined requirement, then the random sending unit 42 is performed; if they do not meet the predetermined requirement, then the user is authenticated as illegal

5 Further, the predetermined template of the predetermined template identification unit 41 takes a rectangle as a feature vector of the face detection, and uses color values in the rectangle to distinguish feature areas in the photograph. The predetermined requirement means that feature areas of photographs of the predetermined template are set according to the color value of the face. For example, an eigenvalue of the feature vector
10 can be defined as: a sum of white rectangle pigments minus a sum of black rectangle pigments, the eye part is darker than the cheek part, two sides of the bridge of the nose are darker than the bridge of the nose, the mouth is darker than the surrounding part, then the black part of the rectangle in Fig. 2(a) can be placed in the eye part or mouth part of the person in the photograph, and the white part of the rectangle in Fig. 2(b) can be placed in
15 the bridge of the nose of the person in the photograph. Other templates which can identify faces can also be used, as long as characteristic parts of the person can be identified.

The specific standard, the predetermined number and the specific value of the receiving authentication unit 43 are determined according to the safety degree required by the authentication, the specific standard can specifically include: not being a cartoon head
20 portrait, star head portrait or children head portrait, not being a photograph of many persons, face having no shelter or not being incomplete, not being a lateral head portrait and so on. For example, if the safety degree required by the authentication is lower, then the specific standard can only be: not being a cartoon head portrait, star head portrait or children head portrait; the predetermined number can be set to three or more persons, the
25 specific value can only be set to 60 points or more (total score 100 points); if the safety degree required by the authentication is very high, then the specific standard needs to be set to: not being a cartoon head portrait, star head portrait or children head portrait, and not being a photograph of many persons, face having no shelter or not being incomplete, not being a lateral head portrait and so on; the predetermined number needs to be set to
30 ten or more, the specific value needs to be set to 70 points or more (total score 100 points).

The designated multiple users can be picked from high level users or users having

strong sense of responsibility by the authentication apparatus or the staff according to user's identity information, for example, one user's level is primary but he can report some irregularities user or actively helps other users, then this user can be designated, or one user's level is senior and he has been operating according to instructions, then this user can also be designated; the designated multiple users can also be determined according to their relationship with the user to be authenticated, for example, a total number of friends which are of the user to be authenticated and which can be designated is less than one half of the designate users, for example, six users are designated in total, then friends of the user to be authenticated cannot be more than 3 persons, can only be 2 persons or 1 person, increasing friends of the user to be authenticated to authenticate can clearly understand whether the user's photographs are his own, and less than half can guarantee the fairness of the authentication.

The apparatus can also include:

a notification unit, configured to notify the staff to audit the plurality of saved photographs of the user which are randomly selected, once again, after the user is authenticated as illegal, and notify the user that the authentication is illegal if the audit result is still disqualified, if the audit result is legal, then the user is authenticated as legal.

One embodiment of the present invention provides a technical solution of an apparatus for user authentication, first, the preliminary screening of users completed through the predetermined template identification unit 41 to identify saved photographs of an identical user according to a predetermined template, can mainly authenticate an obviously not qualified user as illegal through the face recognition technology and then notify the staff; and then, through the designated users' user distinguishing process of a plurality of saved photographs of the user which are randomly selected or designated users' user scoring process of a plurality of saved photographs of the user which are randomly selected, and through a judging process of whether more than a predetermined number of designated users judge that they are photographs of the identical user in the user distinguishing process or whether more than a predetermined number of designated users give scores larger than or equal to a specific value in the scoring process, some star head portraits, cartoon head portraits or children head portraits are screened out and are notified to administrators; finally, after the staff audits photographs of reported some controversial users, user authentication can be achieved. This simplifies the workload of

the staff; the cost of the audit can be saved through the preliminary screening, the user distinguishing or scoring process, and users to be authenticated are provided with convenient; safety and accuracy of user authentication can be guaranteed, so that legally authenticated user can pass the authentication in the shortest time, which increases the speed of user authentication and meets the needs of the users.

The specific implementations of the processing functions of each unit contained in the above apparatus have been described in the previous examples of the method; those will not be repetitively described here.

The foregoing are only preferred embodiments of the present invention and are not for use in limiting the protection scope thereof. All modifications, equivalent replacements or improvements in accordance with the spirit and principles of the present invention shall be included in the protection scope of the present invention. Thus, the scope of protection of the present invention should be based on the claims as appended.

Claims

1. A method for user authentication, comprising:

identifying saved photographs of an identical user according to a predetermined template, if they meet a predetermined requirement, then sending a plurality of saved
5 photographs of the user which are randomly selected to a plurality of designated users for judging or giving scores;

if more than a predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, or if more than the predetermined number of the designated users give for
10 the plurality of saved photographs of the user which are randomly selected according to a specific standard scores greater than or equal to a specific value, then the user is authenticated as legal;

if they do not meet the predetermined requirement, or more than the predetermined number of the designated users judge that the plurality of saved photographs of the user
15 which are randomly selected, are not photographs of the identical user, or more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are randomly selected according to the specific standard scores less than the specific value, then the user is authenticated as illegal.

2. The method according to claim 1, wherein before identifying saved photographs
20 of an identical user according to a predetermined template, the method further comprises:

continuously shooting by a video and saving a plurality of photographs of the user, or receiving and saving a plurality of photographs sent by the user.

3. The method according to claim 1, wherein the predetermined template takes a rectangle as a feature vector of face detection, and uses color values in the rectangle to
25 distinguish feature areas in the photographs, the predetermined requirement means that the feature areas in the photographs of the predetermined template are set according to color values of the face.

4. The method according to claim 1, wherein the specific standard, the predetermined number and the specific value are determined according to safety degree

required by an authentication, the specific standard includes: not being a cartoon head portrait, star head portrait or children head portrait, not being a photograph of many persons, face having no shelter or not being incomplete, not being a lateral head portrait.

5 5. The method according to claim 1, wherein the designated multiple users are determined according to levels in users' identity information or according to their relationship with the user to be authenticated.

6. The method according to any one of claims from 1 to 5, wherein after the user is authenticated as illegal, the method further comprises sending the plurality of saved photographs of the user which are randomly selected, to a staff for auditing, and notifying
10 the user that the authentication is illegal if the audit result is disqualified, if the audit result is legal, then the user is authenticated as legal.

7. An apparatus for user authentication, comprising:

 a predetermined template identification unit, configured to identify saved photographs of an identical user according to a predetermined template, if they meet a
15 predetermined requirement, then a random sending unit is performed; if they do not meet the predetermined requirement, then the user is authenticated as illegal;

 the random sending unit, configured to randomly select a plurality of saved photographs of the user and send the plurality of saved photographs of the user which are randomly selected to a plurality of designated users for judging or giving scores;

20 a receiving authentication unit, configured to receive a judgment result or score response of the designated users sent by the random sending unit, if more than a predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are photographs of the identical user, or if more than the predetermined number of the designated users give for the
25 plurality of saved photographs of the user which are randomly selected scores greater than or equal to a specific value according to a specific standard, then the user is authenticated as legal, if more than the predetermined number of the designated users judge that the plurality of saved photographs of the user which are randomly selected, are
30 not photographs of the identical user, or if more than the predetermined number of the designated users give for the plurality of saved photographs of the user which are

randomly selected scores less than a specific value according to the specific standard, then the user is authenticated as illegal.

8. The apparatus according to claim 7, wherein the apparatus further includes:

5 a storage unit, configured to save a plurality of photographs of the user which are continuously shot by a video, or save received a plurality of photographs of the user, before the predetermined template identification unit identifies the saved photographs of the identical user according to the predetermined template.

10 9. The apparatus according to claim 7, wherein the predetermined template of the predetermined template identification unit takes a rectangle as a feature vector of face detection, and uses color values in the rectangle to distinguish feature areas in the photographs, the predetermined requirement means that the feature areas in the photographs of the predetermined template are set according to color values of the face.

15 10. The apparatus according to claim 7, wherein the specific standard, the predetermined number and the specific value of the receiving authentication unit are determined according to safety degree required by an authentication, the specific standard includes: not being a cartoon head portrait, star head portrait or children head portrait, not being a photograph of many persons, face having no shelter or not being incomplete, not being a lateral head portrait.

20 11. The method according to claim 7, wherein the designated multiple users of the random sending unit are determined according to levels in users' identity information or according to their relationship with the user to be authenticated.

25 12. The apparatus according to any one of claims from 7 to 11, further comprising a notification unit which is configured to notify a staff to audit the plurality of saved photographs of the user which are randomly selected after the user is authenticated as illegal, and notify the user that the authentication is illegal if the audit result is disqualified, if the audit result is legal, then the user is authenticated as legal.