

CLAIMS

1. A method for user authentication based on feature information, comprising:
judging whether a user to be authenticated belongs to a similar user group, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition; and
authenticating the user to be authenticated according to reference feature information in the similar user group if the user to be authenticated belongs to the similar user group,
wherein the method further comprises:
acquiring reference feature information and sample feature information corresponding to each one of at least two sample users, wherein the reference feature information of the at least two sample users meets the preset similarity condition;
calculating, for any of the sample users, similarity degrees between the sample feature information corresponding to the sample user and the reference feature information corresponding to each sample user;
judging whether the at least two sample users meet the preset distinguishability condition according to the calculated similarity degrees; and
adding the at least two sample users to the same similar user group when the at least two sample users meet the preset distinguishability condition.
2. The method according to claim 1, wherein the authenticating the user to be authenticated according to reference feature information in the similar user group comprises:
acquiring feature information collected for the user to be authenticated;
comparing the collected feature information with each piece of reference feature

information in the similar user group to obtain a first comparison result; and

determining whether the user to be authenticated passes the authentication according to the first comparison result.

3. The method according to claim 1, wherein the judging whether a user to be authenticated belongs to a similar user group comprises:

acquiring identifier information of the user to be authenticated; and

judging whether the identifier information of the user to be authenticated matches identifier information of a similar user in a pre-stored similar user group; if yes, determining that the user to be authenticated belongs to the similar user group; otherwise, determining that the user to be authenticated does not belong to the similar user group.

4. The method according to any of claims 1 to 3, wherein the preset similarity condition comprises: a similarity degree of the reference feature information reaches a preset threshold.

5. The method according to any of claims 1 to 3, wherein the preset distinguishability condition comprises: based on comparisons of similarity degrees between the sample feature information of the similar user and each piece of reference feature information in the similar user group to which the similar user belongs, a ratio of the number of successful similarity degree comparisons is greater than a preset ratio value.

6. The method according to claim 2, wherein the comparing the collected feature information with each piece of reference feature information in the similar user group to obtain a

first comparison result comprises:

calculating a first similarity degree between the collected feature information and reference feature information corresponding to a first similar user in the similar user group, and calculating a second similarity degree between the collected feature information and reference feature information corresponding to a second similar user in the similar user group, wherein the first similar user is a similar user having the same identifier information as that of the user to be authenticated, and the second similar user is a similar user whose identifier information is different from that of the user to be authenticated;

correspondingly, the determining whether the user to be authenticated passes the authentication according to the first comparison result comprises:

determining that the user to be authenticated passes the authentication if the first similarity degree is greater than the second similarity degree; and

determining that the user to be authenticated does not pass the authentication if the first similarity degree is not greater than the second similarity degree.

7. The method according to claim 1, wherein the judging whether the at least two sample users meet the preset distinguishability condition according to the calculated similarity degrees comprises:

comparing a third similarity degree between the sample feature information corresponding to the sample user and the reference feature information corresponding to the sample user with a fourth similarity degree between the sample feature information corresponding to the sample user and the reference feature information corresponding to the sample users other than the sample user, to obtain a second comparison result;

judging whether the third similarity degree is greater than the fourth similarity degree

according to the second comparison result;

if yes, determining that a comparison of similarity degrees between the sample feature information corresponding to the sample user and the reference feature information corresponding to each sample user is successful; otherwise, determining that the comparison of similarity degrees between the sample feature information corresponding to the sample user and the reference feature information corresponding to each sample user is failed; and

collecting statistics on a ratio of the number of successful similarity degree comparisons, and determining that the at least two sample users meet the preset distinguishability condition when the ratio of the number is greater than the preset ratio value.

8. The method according to claim 1, further comprising:

acquiring a global user information database when the user to be authenticated does not belong to the similar user group, the global user information database comprising reference feature information and identifier information corresponding to each one of users in excess of a preset number;

determining reference feature information corresponding to the user to be authenticated in the global user information database according to identifier information corresponding to the user to be authenticated; and

authenticating the user to be authenticated according to the reference feature information corresponding to the user to be authenticated.

9. The method according to claim 3, wherein the feature information comprises at least one piece of the following information: a face feature, an iris feature, a fingerprint, and an

eyepoint, and the identifier information comprises at least one of an ID number, a communication number, a name, and predetermined identifier information.

10. A method for user authentication based on feature information, comprising:
receiving an authentication request of a user to be authenticated, the authentication request comprising identifier information of the user to be authenticated;

judging whether the user to be authenticated belongs to a similar user group according to the identifier information of the user to be authenticated, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition;

if the user to be authenticated belongs to the similar user group, acquiring feature information collected for the user to be authenticated, calculating a first similarity degree between the collected feature information and reference feature information corresponding to a first similar user in the similar user group, and calculating a second similarity degree between the collected feature information and reference feature information corresponding to a second similar user in the similar user group, wherein the first similar user is a similar user having the same identifier information as that of the user to be authenticated, and the second similar user is a similar user whose identifier information is different from that of the user to be authenticated;
and

determining that the user to be authenticated passes the authentication if the first similarity degree is greater than the second similarity degree,

wherein the preset distinguishability condition comprises: based on comparisons of similarity degrees between sample feature information of a similar user and each piece of

reference feature information in the similar user group to which the similar user belongs, a ratio of the number of successful similarity degree comparisons is greater than a preset ratio value.

11. An apparatus for user authentication based on feature information, comprising:

a first judgment module configured to judge whether a user to be authenticated belongs to a similar user group, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition;

a first authentication module configured to authenticate the user to be authenticated according to reference feature information in the similar user group if the user to be authenticated belongs to the similar user group; and

a creation module configured to create the similar user group, wherein the creation module comprises:

an acquisition unit configured to acquire reference feature information and sample feature information corresponding to each one of at least two sample users, wherein the reference feature information of the at least two sample users meets the preset similarity condition;

a calculation unit configured to calculate, for any of the sample users, similarity degrees between the sample feature information corresponding to the sample user and the reference feature information corresponding to each sample user;

a judgment unit configured to judge whether the at least two sample users meet the preset distinguishability condition according to the calculated similarity degrees; and

an adding unit configured to add the at least two sample users to the same similar user

group when the at least two sample users meet the preset distinguishability condition.

12. The apparatus according to claim 11, wherein the first authentication module comprises:

a first acquisition unit configured to acquire feature information collected for the user to be authenticated;

a comparison unit configured to compare the collected feature information with each piece of reference feature information in the similar user group to obtain a first comparison result; and

a determining unit configured to determine whether the user to be authenticated passes the authentication according to the first comparison result.

13. The apparatus according to claim 11, wherein the first judgment module comprises:

an identifier information acquisition unit configured to acquire identifier information of the user to be authenticated; and

a first judgment unit configured to judge whether the identifier information of the user to be authenticated matches identifier information of a similar user in a pre-stored similar user group; if yes, determine that the user to be authenticated belongs to the similar user group; otherwise, determine that the user to be authenticated does not belong to the similar user group.

14. The apparatus according to claim 12, wherein the comparison unit is configured to calculate a first similarity degree between the collected feature information and reference feature information corresponding to a first similar user in the similar user group, and calculate a second similarity degree between the collected feature information and reference feature information

corresponding to a second similar user in the similar user group, wherein the first similar user is a similar user having the same identifier information as that of the user to be authenticated, and the second similar user is a similar user whose identifier information is different from that of the user to be authenticated; and

correspondingly, the determining unit is configured to determine that the user to be authenticated passes the authentication if the first similarity degree is greater than the second similarity degree; and determine that the user to be authenticated does not pass the authentication if the first similarity degree is not greater than the second similarity degree.

15. An apparatus for user authentication based on feature information, comprising:

a receiving module configured to receive an authentication request of a user to be authenticated, the authentication request comprising identifier information of the user to be authenticated;

a judgment module configured to judge whether the user to be authenticated belongs to a similar user group according to the identifier information of the user to be authenticated, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition;

a calculation module configured to, if the user to be authenticated belongs to the similar user group, acquire feature information collected for the user to be authenticated, calculate a first similarity degree between the collected feature information and reference feature information corresponding to a first similar user in the similar user group, and calculate a second similarity degree between the collected feature information and reference feature information

corresponding to a second similar user in the similar user group, wherein the first similar user is a similar user having the same identifier information as that of the user to be authenticated, and the second similar user is a similar user whose identifier information is different from that of the user to be authenticated; and

a determining module configured to determine that the user to be authenticated passes the authentication if the first similarity degree is greater than the second similarity degree,

wherein the preset distinguishability condition comprises: based on comparisons of similarity degrees between sample feature information of a similar user and each piece of reference feature information in the similar user group to which the similar user belongs, a ratio of the number of successful similarity degree comparisons is greater than a preset ratio value.

16. An apparatus for user authentication based on feature information, comprising:

a processor; and

a memory configured to store computer executable instructions, wherein the processor is enabled to perform the following steps when the computer executable instructions are executed:

judging whether a user to be authenticated belongs to a similar user group, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition; and

authenticating the user to be authenticated according to reference feature information in the similar user group if the user to be authenticated belongs to the similar user group,

wherein the processor is further enabled to perform the following steps:

acquiring reference feature information and sample feature information corresponding

to each one of at least two sample users, wherein the reference feature information of the at least two sample users meets the preset similarity condition;

calculating, for any of the sample users, similarity degrees between the sample feature information corresponding to the sample user and the reference feature information corresponding to each sample user;

judging whether the at least two sample users meet the preset distinguishability condition according to the calculated similarity degrees; and

adding the at least two sample users to the same similar user group when the at least two sample users meet the preset distinguishability condition.

17. An apparatus for user authentication based on feature information, comprising:

a processor; and

a memory configured to store computer executable instructions, wherein the processor is enabled to perform the following steps when the computer executable instructions are executed:

receiving an authentication request of a user to be authenticated, the authentication request comprising identifier information of the user to be authenticated;

judging whether the user to be authenticated belongs to a similar user group according to the identifier information of the user to be authenticated, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition;

if the user to be authenticated belongs to the similar user group, acquiring feature information collected for the user to be authenticated, calculating a first similarity degree between the collected feature information and reference feature information corresponding to a

first similar user in the similar user group, and calculating a second similarity degree between the collected feature information and reference feature information corresponding to a second similar user in the similar user group, wherein the first similar user is a similar user having the same identifier information as that of the user to be authenticated, and the second similar user is a similar user whose identifier information is different from that of the user to be authenticated; and

determining that the user to be authenticated passes the authentication if the first similarity degree is greater than the second similarity degree,

wherein the preset distinguishability condition comprises: based on comparisons of similarity degrees between sample feature information of a similar user and each piece of reference feature information in the similar user group to which the similar user belongs, a ratio of the number of successful similarity degree comparisons is greater than a preset ratio value.

18. A storage medium for storing computer executable instructions, wherein the following processes are implemented when the computer executable instructions are executed:

judging whether a user to be authenticated belongs to a similar user group, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition; and

authenticating the user to be authenticated according to reference feature information in the similar user group if the user to be authenticated belongs to the similar user group,

wherein the following processes are further implemented:

acquiring reference feature information and sample feature information corresponding

to each one of at least two sample users, wherein the reference feature information of the at least two sample users meets the preset similarity condition;

calculating, for any of the sample users, similarity degrees between the sample feature information corresponding to the sample user and the reference feature information corresponding to each sample user;

judging whether the at least two sample users meet the preset distinguishability condition according to the calculated similarity degrees; and

adding the at least two sample users to the same similar user group when the at least two sample users meet the preset distinguishability condition.

19. A storage medium for storing computer executable instructions, wherein the following processes are implemented when the computer executable instructions are executed:

receiving an authentication request of a user to be authenticated, the authentication request comprising identifier information of the user to be authenticated;

judging whether the user to be authenticated belongs to a similar user group according to the identifier information of the user to be authenticated, wherein the similar user group comprises at least two similar users, and the similar users are users whose reference feature information meets a preset similarity condition and a preset distinguishability condition;

if the user to be authenticated belongs to the similar user group, acquiring feature information collected for the user to be authenticated, calculating a first similarity degree between the collected feature information and reference feature information corresponding to a first similar user in the similar user group, and calculating a second similarity degree between the collected feature information and reference feature information corresponding to a second

similar user in the similar user group, wherein the first similar user is a similar user having the same identifier information as that of the user to be authenticated, and the second similar user is a similar user whose identifier information is different from that of the user to be authenticated; and

determining that the user to be authenticated passes the authentication if the first similarity degree is greater than the second similarity degree,

wherein the preset distinguishability condition comprises: based on comparisons of similarity degrees between sample feature information of a similar user and each piece of reference feature information in the similar user group to which the similar user belongs, a ratio of the number of successful similarity degree comparisons is greater than a preset ratio value.