

METHOD AND DEVICE FOR INFORMATION INTERACTION AND ASSOCIATION BETWEEN HUMAN BIOLOGICAL FEATURE DATA AND ACCOUNT

Technical Field

The present application relates to the field of information interaction technologies, and in particular, to information interaction methods and apparatuses, and methods and apparatuses for associating human biological data with an account.

Background

Human biological data includes a facial feature, a fingerprint feature, a palmprint feature, a retinal feature, a skeletal feature, a heartbeat feature, etc., possessing characteristics that are strongly personalized and difficult to be imitated. Therefore, based on human biological data, operations, such as fast and secure account login and information interaction, can be implemented by directly scanning human biological data of a user, without the need of the user to record information such as an account, a password, etc.

Summary

The present application provides a method and an apparatus for information interaction, and a method and an apparatus for associating human biometric data with an account, which can reduce the number of times of acquiring the human biometric data, and enhance the efficiency of information interaction.

In order to achieve the foregoing objectives, the present application provides the following technical solutions.

According to a first aspect of the present application, an information interaction method is provided, comprising, at a device of a first information interaction party:

acquiring, when an information interaction operation with a user account of the information interaction party is triggered, human biometric data of a user acting as an information interaction party;

suspending the information interaction operation upon determining that no matching user account is found based on the human biometric data;

uploading the human biometric data to a server in order to establish an association relationship between the user account of the user and the human biometric data;

resuming the information interaction operation when a user account matching the human biometric data sent by the server is received; and

completing the information interaction operation with the user account matching the human biometric data.

There is also disclosed an information interaction method is provided, which includes:

sending a data query request to a server using a logged-in account to query human biometric data of a user corresponding to the logged-in account, which is acquired and uploaded by a device to which a user account of an information interaction party belongs;

sending an association request to the server to establish an association relationship between the logged-in account and human biometric data that is found; and

completing an information interaction operation with the user account of the information interaction party when interaction information sent by the account of the information interaction party according to the association relationship is received.

According to a second aspect of the present application, an information interaction method comprises, at a server:

receiving, from a first device of a first information interaction party in an information operation, human biometric data;

associatively storing the human biometric data and corresponding identification information of the user acting as a second information interaction party;

receiving, from a second device of the user acting as a second information interaction party, request information from a user account of the user acting as a second information interaction party, the request information including identification information; and

searching for human biometric data corresponding to the identification information included in the request information;

establishing an association relationship between the user account and human biometric data that is found; and

sending information of the user account of the user acting as a second information interaction party to the first device.

According to a third aspect of the present application, an information interaction apparatus is provided, which includes:

an acquisition unit configured to acquire, when an information interaction operation between a user account of a first information interaction party and a user account of a second information interaction party is triggered at the apparatus, human biometric data of a user acting as the second information interaction party;

a processing unit configured to: suspend the information interaction operation upon determining that no matching user account is found based on the human biometric data; and upload the human biometric data to a server in order to establish an association relationship between the user account of the user and the human biometric data;

an interaction unit configured to: resume the information interaction operation when a user account matching the human biometric data sent by the server is received; and complete the information interaction operation with the user account matching the human biometric data.

According to a fourth aspect of the present application, an information interaction apparatus is provided, which includes:

a query unit configured to send a data query request to a server using a logged-in account to query human biometric data of a user corresponding to the logged-in account,

which is acquired and uploaded by a device to which a user account of a second information interaction party belongs, the data query request including identification information of the first information interaction party;

an association unit configured to send an association request to the server to establish an association relationship between the logged-in account and the queried human biometric data; and

an interaction unit configured to complete an information interaction operation with the user account of the second information interaction party when interaction information sent by the account of the information interaction party according to the association relationship is received.

According to a fifth aspect of the present application, an information interaction is provided, which includes:

a data receiving unit configured to receive, from a first device of a first information interaction party in an information operation, human biometric data of the user acting as a second information interaction party;

an association storage unit configured to associatively store the human biometric data and corresponding identification information of the user acting as a second information interaction party;

a request receiving unit configured to receive, from a second device of the user acting as a second information interaction party, request information from a user account, of the user acting as a second information interaction party, the request information comprising the identification information;

an association processing unit configured to search for human biometric data corresponding to the identification information included in the request information, and establish an association relationship between the user account and human biometric data that is found; and

an information sending unit configured to send information of the user account of the user acting as a second information interaction party to the first device.

As can be seen from the above technical solutions, the present application waits for a user of an information interaction party to establish an association relationship between human biometric data and a user account in real time, by suspending and resuming an

information interaction operation, thus reducing the number of times of acquiring the human biometric data, avoiding the number of times of performing information interaction operations, and thus facilitating an improvement in the efficiency of information interaction.

Brief Description of the Drawings

FIG. 1 is a flowchart of an information interaction method.

FIG. 2 is a flowchart of another information interaction method.

FIG. 3A is a flowchart of an information interaction method from the perspective of a terminal according to an exemplary embodiment of the present application.

FIG. 3B is a flowchart of an information interaction method from the perspective of a terminal according to another exemplary embodiment of the present application.

FIG. 4 is a flowchart of performing a payment service according to an exemplary embodiment of the present application.

FIG. 5 is a flowchart of a method of associating human biometric data with an account from the perspective of a server according to an exemplary embodiment of the present application.

FIG. 6 is a schematic structural diagram of a terminal according to an exemplary embodiment of the present application.

FIG. 7 is a block diagram of an information interaction apparatus according to an exemplary embodiment of the present application.

FIG. 8 is a block diagram of an information interaction apparatus according to another exemplary embodiment of the present application.

FIG. 9 is a schematic structural diagram of a server according to an exemplary embodiment of the present application.

FIG. 10 is a block diagram of an apparatus for associating human biometric data with an account according to another exemplary embodiment of the present application.

Detailed Description

When an information interaction between users is implemented, operations of sending and receiving interaction information between individual user accounts corresponding to the users needed to be performed based on the user accounts. In a process of information interaction based on human biometric data, an association is actually established between human biometric data of a user and a user account, so that a process of operations of information interaction can be implemented more easily and securely by making use of characteristics of the human biometric data, such as being easy to acquire and difficult to imitate, and being highly secure.

As shown in FIG. 1, if information interaction is implemented between a user A and a user B, a common processing procedure is given as follows:

At step 102, the user A and the user B separately store association relationships between user accounts thereof and human biometric data thereof in a server. A user account corresponding to the user A is assumed to be an account A, and human biometric data corresponding to the user A is assumed to be a feature 1. A user account corresponding to the user B is assumed to be an account B, and human biometric data corresponding to the user B is assumed to be a feature 2. In this case, association relationships: the account A -- the feature 1, and the account B -- the feature 2 are individually stored in the server for the user A and the user B.

At step 104, the server associatively stores user accounts and human biometric data that are received, for example, the account A and the feature 1, the account B and the

feature 2, etc., as shown in FIG. 1.

At Step 106, an information interaction operation is assumed to be triggered by the user A.

At step 108, the user A scans the user B using a scanning device to obtain the human biometric data of the user B, for example, the feature 2.

At step 110, the user A sends a query request to the server via a terminal, the query request including the scanned feature 2.

At step 112, the server finds that a user account matching the feature 2 is the account B, based on a prestored association relationship: the account B -- the feature 2, and returns a query result including the account B to the user A.

Apparently, if the user B triggers an information interaction operation at step 106, the user B scans the user A using a scanning device to obtain the feature 1 at step 108. The user B sends a query request including the feature 1 to the server at step 110. The server may find the account A corresponding to the feature 1 uploaded by the user B according to an association relationship: the account A -- the feature 1 at step 112.

At step 114, the user A performs information interaction with the account B (corresponding to the user B) via the account A, thus implementing the information interaction between the user A and the user B.

Through the above processing procedure as shown in FIG. 1, an information interaction between the user A and the user B may be easily implemented, and another user who logs into the account B is prevented from imitating as the user B through scanning the feature of the user B.

Nevertheless, an implementation of the above processing procedure relies on step 102. Specifically, both parties of information interaction need to store association relationships

between respective user accounts and respective human biometric data in a server in advance, so that a user account corresponding to human biometric data obtained by scanning can be found based on the prestored association relationships (i.e., step 112) during a process of operations of information interaction.

However, especially when an application function is just launched, the server may not have stored user accounts and human biometric data of a number of users associatively, thus leading to processing as shown in FIG. 2:

At step 202, only the user A uploads the account A and the feature 1 thereof to the server.

At step 204, the server stores the account A and the feature 1 in association.

At step 206, the user A triggers a first information interaction operation.

At step 208, the user A scans the user B via a scanning device, and obtains human biometric data of the user B, for example, the feature 2.

At step 210, the user A sends a query request to the server via a terminal, the query request including the scanned feature 2.

At step 212, the server cannot find a user account matching the feature 2, and returns a query result of "Not found" to the user A because the user B does not upload and store the account B and the feature 2 associatively to the server.

At step 214, a first information interaction operation triggered by the user A ends because an information interaction party cannot be determined.

At step 216, the user B needs to scan himself/herself using the scanning device, and stores human biometric data that is obtained, e.g., the feature 2, and the account B associatively in the server.

At step 218, the user A triggers a second information interaction operation.

At step 220, the user A scans the user B via the scanning device, and obtains the human biometric data of the user B, for example, the feature 2.

At step 222, the user A sends a query request to the server via the terminal, the query request including the scanned feature 2.

At step 224, the server finds that the user account matching the feature 2 is the account B based on the prestored association relationship: the account B -- the feature 2, and returns a query result including the account B to the user A.

At step 226, the user A performs an information interaction with the account B (corresponding to the user B) via the account A, thus implementing the information interaction between the user A and the user B.

As can be seen, when an information interaction party does not store a user account and human biometric data associatively in advance, information interaction operations need to be triggered at least twice (step 206 and step 218) and human biometric data needs to be scanned for three times (step 208, step 216 and step 220). A process of operations thereof is very complex and cumbersome.

However, in the technical solutions of the present application, the number of times of acquiring human biometric data can be reduced, user operations are simplified, and the efficiency of information interaction is enhanced.

To further describe the present application, an embodiment is provided as follows.

Referring to FIG. 3A, FIG. 3A shows a flowchart of an information interaction method according to an exemplary embodiment of the present application. The method is applied to a terminal, and may include the following steps.

At step 302, when an information interaction operation with a user account of an information interaction party is triggered, human biometric data of a user acting as the

information interaction party is acquired.

In the present embodiment, the human biometric data may include at least one of the followings: a facial feature, a fingerprint feature, a palmprint feature, a retinal feature, a skeletal feature, a heartbeat feature, etc. Apparently, one skilled in the art should understand that the present application does not limit a specific type of "human biometric data", and, other biological features that can be used for user identification can obviously also be applicable to the technical solution of the present application.

Specifically, in the present embodiment, an information interaction operation may be directly triggered via an APP (Application) installed in a terminal. Alternatively, the information interaction operation may be indirectly triggered by calling a function between APPs.

At step 304, the information interaction operation is suspended if determining that no matching user account exists based on the human biometric data, and the human biometric data is uploaded to a server via a device to establish an association relationship between the user account of the user and the human biometric data.

In the present embodiment, the acquired human biometric data may be uploaded to the server according to the user account by logging into the user account on the device.

In the present embodiment, user accounts and respective human biometric data may be stored in a mapping relationship database associatively, and a user account matching the acquired human biometric data may be determined by querying the mapping relationship database.

As an exemplary implementation, the user may download and store a mapping relationship database in a local terminal to form a corresponding local mapping relationship database, and search for a user account matching the acquired human biometric data in the

local mapping relationship database. At the same time, data update may further be performed regularly with the server to ensure data in the local mapping relationship database is up to date.

Preferably, for a mapping relationship stored in the local mapping relationship database, a corresponding user account may be a user account of a friend (such as a contact in an address book), or may be a user account having an account relationship based on a previously performed information interaction operation, to avoid an excessive occupancy of a local storage space or a reduction in query efficiency due to an excessively large volume of data stored in the local mapping relationship database.

As another exemplary implementation, an online mapping relationship database may be created in the server, and the user may send the acquired human biometric data to the server so that the server searches for a user account matching the human biometric data in the online mapping relationship database. Using the online mapping relationship database, mapping relationships therein may be updated online, and data is ensured to be up to date.

In the present embodiment, by storing the acquired human biometric data in the server, the user acting as the information interaction party may directly use the human biometric data. In other words, the association relationship is established between his/her own account and the human biometric data, and the user does not need to scan and acquire his/her own human biometric data again, thus effectively reducing the number of times of acquiring the human biometric data and enhancing the efficiency of information interaction.

At step 306, after the user account matching the human biometric data is received from the server, the information interaction operation is resumed, and the information interaction operation is completed with the user account matching the human biometric data.

In the present embodiment, by resuming the information interaction operation, the user needs to neither perform the information interaction operation again nor reacquire the human biometric data of the user acting as the information interaction party, thus facilitating an enhancement of the efficiency of information interaction.

In the present embodiment, as an exemplary implementation, after the user acting as the information interaction party establishes the user account corresponding to the human biometric data (which is uploaded to the server at step 304), the server may directly push the user account to the terminal. As another exemplary implementation, the terminal may initiate a polling operation to the server after step 304, and then the server may return the matching user account as a query result to the terminal according to the polling operation.

In the embodiment as shown in FIG. 3A, the description is made from the perspective of the user A as shown in FIG. 1 and FIG. 2, i.e., the embodiment is applied in the terminal of the user A. Correspondingly, referring to FIG. 3B, FIG. 3B shows a flowchart of an information interaction method according to another exemplary embodiment of the present application. The method may be applied in a terminal of the user B as shown in FIG. 1 and FIG. 2, and may include the following steps:

At step 302', a data query request is sent to a server using a logged-in account to query human biometric data of a user corresponding to the logged-in account, which is acquired and uploaded by a device to which a user account of an information interaction party belongs.

In the present embodiment, the user does not need to reacquire his/her own human biometric data, but directly uses the human biometric data acquired and uploaded to the server according to the embodiment as shown in FIG. 3A, thus reducing the number of times of acquiring the human biometric data.

At step 304', an association request is sent to the server to establish an association relationship between the logged-in account and human biometric data that is found.

At step 306', when interaction information sent from the information interaction account according to the association relationship is received, an information interaction operation is completed with the user account of the information interaction party.

As can be seen from the foregoing embodiment, when no user account that matches acquired human biometric data is found, a user interaction operation is not ended directly, but is suspended and resumed in the present application, thus avoiding triggering the information interaction operation multiple times. Furthermore, by uploading the acquired human biometric data to a server, the user acting as an information interaction party does not need to reacquire his/her own human biometric data, and may directly configure a corresponding user account for the uploaded human biometric data, thus facilitating a reduction in the number of times of acquiring the human biometric data and enhancing the efficiency of information interaction.

According to the technical solutions, the present application may be applied to various types of information interaction scenarios. For example, a specific application scenario of a "payment service" is taken as an example to describe an implementation process of the solutions in detail hereinafter. Referring to FIG. 4, FIG. 4 shows a flowchart of performing a payment service according to an exemplary embodiment of the present application. The method relates to a process that the user A makes a payment to the user B, which may include the following steps.

At step 402, after the user A triggers a payment service with the user B, a facial image of the user B is obtained by scanning.

In the present embodiment, the payment service may be directly triggered by the user

A. For example, the payment service may be triggered via an "Alipay™" client in a terminal such as a cell phone or a tablet computer. Alternatively, the payment service may be triggered by the user through a "Purchase" operation, for example.

In the present embodiment, the user A may directly acquire human biometric data of the user B via a functional component configured in a terminal, or may connect to an external functional component through a wired or wireless manner and receive data sent by the external functional component after the external functional component scans and acquires the human biometric data of the user B. If the human biometric data used herein is a facial image, the user A may scan and acquire the facial image of the user B via an internal or external camera of the terminal.

In the present embodiment, the human biometric data may also be acquired in advance. For example, the user A stores the facial image of the user B in the terminal in advance, so that an interaction may be performed using previously acquired information even if the user B is not present.

At step 404, the user A sends the facial image of the user B to the server, and the server searches for a user account matching the facial image.

In the present embodiment, as an exemplary implementation, an online database may be configured in the server, and mapping relationships between facial images and user accounts that are uploaded by users in advance are stored in the online database. Based on the facial image uploaded by the user A, a search can be made as to whether a user account matching thereto exists.

Apparently, as another exemplary implementation, the user A may also download the mapping relationship to a terminal thereof to establish a corresponding local database, and search for a user account matching the facial image locally.

At step 406, if a matching user account exists, step 420 is performed. Otherwise, step 408 is performed.

At step 408, the user A suspends the payment transaction with the user B.

At step 410, the user A uploads and stores the acquired facial image of the user B to the server.

In the present embodiment, "step 408" and "step 410" are only used to distinguish two steps of operation, but are not used to limit a specific order of execution thereof.

As an exemplary implementation, the user B may apparently determine his/her own facial image by viewing and examining facial images on the server one by one.

As another exemplary implementation, as facial images (or other human biometric data) of many users may exist in the server, the user A may associatively upload the acquired facial image and corresponding identification information to the server at step 410, and the user B may thus quickly acquire the facial image corresponding thereto from the server based on the identification information.

When the user A generates and then uploads identification information to the server, the identification information may include at least one of the following: account attribute information of a local logged-in account, time information of human biometric data that is uploaded by a terminal device used by the user A, geographical location information of the human biometric data uploaded by the terminal device, attribute information of the terminal device, attribute information of a network environment where the terminal device is located, a self-defined string, and a random string generated by the terminal device. The account attribute information may include: an account name of the user A, a mobile phone number of the user A, etc. The attribute information of the terminal device may include: an ID assigned to the terminal device by the server, an ID of a component in the terminal device,

etc. The attribute information of a network environment where the terminal device is located may include: an IP address of the terminal device, a MAC address, etc. Apparently, if the user A is present with the user B, the user A may manually input random identification information or control the terminal device to generate random identification information, such as a string of random code, so that the user B may find a corresponding facial image according to the random code.

As another exemplary implementation, after receiving the human biometric data uploaded by the user A, the server may generate corresponding identification information therein, and stores the human biometric data and the identification information in association. The server then returns the identification information to a terminal device of the user A. As such, the user B may acquire the identification information from the terminal device, which may be used in subsequent operations of searching and account association of the human biometric data.

When the identification information is generated by the server, the identification information may be a random string. Since the identification information is generated by the server, the uniqueness of each piece of identification information in the server can be ensured.

In the present embodiment, the identification information may be sent to the user B by the user A, and may also be acquired by the user B on his/her own. When the user B acquires the identification information on his/her own, the user A may display the identification information on a screen interface of the terminal, and the user B may: 1) read the identification information, and input thereof into the terminal and upload it to the server, to search for a matching facial image; 2) use a camera on the terminal to automatically recognize the identification information through an OCR technology; 3) the user B may read

and analyze the identification information in a bar code through a corresponding recognition function if the user A generates the bar code corresponding to the identification information, such as a one-dimensional code or a two-dimensional code.

At step 412, the user B finds his/her facial image in the server.

At step 414, the user B associates the found facial image with his/her own user account B.

At step 416, the user B stores a mapping relationship between the found facial image and his/her own user account B in the server. The server may update the mapping relationship to the online database.

At step 418, based on the stored mapping relationship, the server may send the user account B corresponding to the facial image acquired at step 402 to the terminal of the user A to resume the payment transaction.

At step 420, the payment transaction with the user B is completed.

In the above embodiment, a user may complete an information interaction operation by acquiring human biometric data only once, and the information interaction operation does not need to be started for multiple times, thus being conducive to simplifying a process of operations and enhancing the efficiency of information interaction.

Referring to FIG. 5, FIG. 5 shows a flowchart of a method of associating human biometric data with an account from the perspective of a server according to an exemplary embodiment of the present application. The method is applied to a server, and may include the following steps.

At step 502, human biometric data that is uploaded by a device is received.

At step 504, the human biometric data and corresponding identification information are associatively stored.

In the present embodiment, as a number of pieces of human biometric data uploaded by a great number of user accounts may exist in the server, associatively storing the pieces of human biometric data and respective pieces of identification information facilitates discrimination of different pieces of human biometric data effectively and avoids confusion.

As an exemplary implementation, identification information may be uploaded by a user using a device, and the identification information at this point may include at least one of the following: account attribute information of a logged-in account in the device, time information of human biometric data uploaded by the device, geographical location information of the human biometric data uploaded by the device, attribute information of the device, attribute information of a network environment where the device is located, a self-defined string, and a random string generated by the device.

As another exemplary implementation, the identification information may be generated locally by the server, and the identification information at this point may be a random string. When the server generates identification information, the uniqueness of each piece of identification information can be ensured, which avoids a reduction in the efficiency of acquiring correct human biometric data due to too many query results being returned when the user uses the identification information to conduct a search.

At step 506, request information from a user account is received, the request information including the identification information.

In the present embodiment, the user account sending the request information may be an account that is the same as or different from the user account that sends the human biometric data at step 502.

At step 508, the human biometric data corresponding to the identification information included in the request information is searched for, and an association relationship between

the user account and the found human biometric data is established.

As can be seen from the above embodiment, by uploading human biometric data of a user to a server in the present application, the user may directly establish an association relationship between the human biometric data and a user account, thus preventing the user from acquiring the human biometric data for multiple times, and facilitating an enhancement in the efficiency of account association.

In addition, a server-based information interaction operation may further be implemented based on the method of associating human biometric data with an account as shown in FIG. 5, for improving the efficiency of information interaction between users. For example, when the user A hopes to send a photo to the user account b corresponding to the user B, and the user B has not established an association between his/her own facial image and the user account b in advance, the photo from the user A may be sent to the user B indirectly based on information forwarding by the server. Details of a process thereof include the following:

At step 502, the user A acquires a facial image (or other human biometric data) of the user B. However, since the user B does not establish an association between his/her own facial image and the user account b in advance, the user A sends N acquired facial image to A server, and also sends a photo (or other information to be communicated) that needs to be sent to the user B to the server.

At step 504, the photo, the facial image, and a corresponding piece of identification information that are uploaded by the user A are associatively stored. As multiple pieces of information to be communicated, pieces of human biometric data, etc., may be stored in the server, an associative storing operation facilitates effective discrimination of the stored information and data.

At step 506, according to identification information in request information from the user B, the facial image uploaded by the user A may be found so that an association between the user account b and the found facial image is established on one hand. On the other hand, the found photo may be sent to the user B, so that an interaction between the user account a of the user A and the user account b of the user B can be completed.

As can be seen, although an information interaction operation (i.e., an operation of sending a photo) between the user A and the user B is suspended because the user B does not establish an association relationship between his/her own facial image and the user account b in advance, the information interaction operation is resumed and completed successfully based on an association establishing operation performed by the user B afterwards, and through a "relay" of the photo by the server.

FIG. 6 is a schematic structural diagram of a terminal according to an exemplary embodiment of the present application. Referring to FIG. 6, on a hardware level, the electronic device includes processor(s), an internal bus, a network interface, memory, and a non-volatile storage device, and may apparently further include hardware required by other services. The processor(s) read(s) a corresponding computer program from the non-volatile storage device into the memory and runs the computer program, thereby forming an information interaction apparatus on a logic level. Apparently, besides software implementations, the present application does not exclude other implementations, such as implementations in a form of logic devices or a combination of software and hardware. In other words, executing entities in the following flow of processing may include, but not limited to, various logic units, and may also include hardware or logic devices.

Referring to FIG. 7, in a software implementation, in correspondence with the information interaction method as shown in FIG. 3A, the information interaction apparatus

may include an acquisition unit, a processing unit, and an interaction unit.

The acquisition unit is configured to acquire, when an information interaction operation with a user account of an information interaction party is triggered, human biometric data of a user acting as the information interaction party.

The processing unit is configured to suspend the information interaction operation if determining that no matching user account exists based on the human biometric data, and upload the human biometric data to a server via a device, so that the user establishes an association relationship between a user account thereof and the human biometric data.

The interaction unit is configured to resume the information interaction operation when a user account that matches the human biometric data sent by the server is received, and complete the information interaction operation with the user account that matches the human biometric data.

Optionally, the processing unit is specifically configured to:

search for whether the user account matching the human biometric data exists in a local mapping relationship database, wherein the local mapping relationship database stores mapping relationships between pieces of human biometric data and respective user accounts;

or, send the human biometric data to the server to cause the server to search for whether the user account matching the human biometric data exists in an online mapping relationship database, and receive a query result returned from the server, wherein the online mapping relationship database stores mapping relationships between the pieces of human biometric data and the respective user accounts.

Optionally, the apparatus further includes a receiving unit or a generation unit.

The receiving unit is configured to receive, identification information returned by the

server after the human biometric data is sent to the server, wherein the human biometric data and the identification information are associatively stored in the server.

The generation unit is configured to generate the identification information, and send the identification information to the server to store the human biometric data and the identification information associatively in the server.

Optionally, when the identification information is returned by the server, the identification information includes a random string.

When the identification information is generated locally, the identification information includes at least one of the following:

account attribute information of a logged-in account in the device, time information of the human biometric data uploaded by the device, geographical location information of the human biometric data uploaded by the device, attribute information of the device, attribute information of a network environment where the device is located, a self-defined string, and a random string generated by the device.

Optionally, the apparatus further includes:

a display unit configured to display the identification information, or display a barcode graphic generated according to the identification information.

Optionally, the information interaction operation includes:

performing a face-to-face transfer operation with the user account matching the human biometric data.

Referring to FIG. 8, in a software implementation, in correspondence with the information interaction method as shown in FIG. 3B, the information interaction apparatus may include a query unit, an association unit, and an interaction unit.

The query unit is configured to send a data query request to a server using a logged-in

account to query human biometric data of a user corresponding to the logged-in account, which is acquired and uploaded by a device to which a user account of an information interaction party belongs.

The association unit is configured to send an association request to the server to establish an association relationship between the logged-in account and human biometric data that is found.

The interaction unit is configured to complete an information interaction operation with the user account of the information interaction party upon receiving interaction information sent by the account of the information interaction party according to the association relationship.

Optionally, the data query request includes identification information, the identification information being generated by the device and sent to the server, or generated by the server and sent to the device, wherein the human biometric data and the identification information are associatively stored in the server.

Optionally, the apparatus further includes:

an acquisition unit configured to acquire a barcode graphic displayed on a screen interface of the device; and

an analyzing unit configured to analyze the barcode graphic to obtain the identification information.

Optionally, the information interaction operation includes:

performing a face-to-face transfer operation with the user account of the information interaction party.

FIG. 9 is a schematic structural diagram of a server according to an exemplary embodiment of the present application. Referring to FIG. 9, on a hardware level, on a

hardware level, the server includes processor(s), an internal bus, a network interface, memory, and a non-volatile storage device, and may apparently further include hardware required by other services. The processor(s) read(s) a corresponding computer program from the non-volatile storage device into the memory and runs the computer program, thereby forming an apparatus of associating human biometric data with an account on a logic level. Apparently, besides software implementations, the present application does not exclude other implementations, such as implementations in a form of logic devices or a combination of software and hardware. In other words, executing entities in the following flow of processing may include, but not limited to, various logic units, and may also include hardware or logic devices.

Referring to FIG. 10, in a software implementation, the apparatus of associating human biometric data with an account may include a data receiving unit, an association storage unit, a request receiving unit, and an association processing unit.

The data receiving unit is configured to receive human biometric data uploaded by a device.

The association storage unit is configured to associatively store the human biometric data and corresponding identification information.

The request receiving unit is configured to receive request information from a user account, the request information including identification information; and

The association processing unit is configured to search for human biometric data corresponding to the identification information included in the request information, and establish an association relationship between the user account and human biometric data that is found.

Optionally, the identification information is uploaded by the device, or generated

locally.

Optionally, when the identification information is uploaded by the device, the identification information includes at least one of the following:

account attribute information of a logged-in account in the device, time information of the human biometric data uploaded by the device, geographical location information of the human biometric data uploaded by the device, attribute information of the device, attribute information of a network environment where the device is located, a self-defined string, and a random string generated by the device.

When the identification information is generated locally, the identification information includes a random string.

Optionally, the data receiving unit further receives information to be interacted that is uploaded by the device.

The association storage unit further associatively stores the information to be interacted, the human biometric data, and the identification information.

The apparatus further includes an information sending unit configured to send the information to be interacted corresponding to the identification information included in the request information to the user account in response to receiving the request information.

Therefore, by suspending and resuming an information interaction operation, the present application waits for a user of an information interaction party to establish an association relationship between human biometric data and a user account in real time, thus reducing the number of times of acquiring the human biometric data, avoiding to perform an the information interaction operation for a number of times, and facilitating an enhancement in the efficiency of information interaction.

In a typical configuration, a computing device includes one or more processors (CPU),

an input/output interface, a network interface, and memory.

The memory may include a form of computer-readable media, e.g., a non-permanent storage device, random-access memory (RAM) and/or a nonvolatile internal storage, such as read-only memory (ROM) or flash RAM. The memory is an example of computer-readable media.

The computer-readable media may include a permanent or non-permanent type, a removable or non-removable media, which may achieve storage of information using any method or technology. The information may include a computer-readable instruction, a data structure, a program module or other data. Examples of computer storage media include, but not limited to, phase-change memory (PRAM), static random access memory (SRAM), dynamic random access memory (DRAM), other types of random-access memory (RAM), read-only memory (ROM), electronically erasable programmable read-only memory (EEPROM), quick flash memory or other internal storage technology, compact disk read-only memory (CD-ROM), digital versatile disc (DVD) or other optical storage, magnetic cassette tape, magnetic disk storage or other magnetic storage devices, or any other non-transmission media, which may be used to store information that may be accessed by a computing device. As defined herein, the computer-readable media does not include transitory media, such as modulated data signals and carrier waves.

It should be further noted that terms such as "comprise", "include" and any other variants thereof are intended to cover a non-exclusive inclusion. A process, method, product or device that includes a series of elements not only includes those elements, but also includes other elements that are not explicitly listed, or further includes elements that already existed in such process, method, product or device. In a condition without further limitations, an element defined by a phrase "include a/an ..." does not exclude any other

similar elements from existing in the process, method, product or device.

The above descriptions are merely preferred embodiments of the present application, but not intended to limit the present application. Any modifications, equivalent replacements, improvements, and the like shall fall in the scope of protection of the present application.

Claims

1. An information interaction method, comprising, at a server:
 - receiving, from a first device of a first information interaction party in an information operation, human biometric data of a user acting as a second information interaction party;
 - associatively storing the human biometric data and corresponding identification information of the user acting as a second information interaction party;
 - receiving, from a second device of the user acting as a second information interaction party, request information from a user account of the user acting as a second information interaction party, the request information comprising the identification information;
 - searching for the human biometric data corresponding to the identification information included in the request information;
 - establishing (416) an association relationship between the user account and the human biometric data that is found; and
 - sending (418) information of the user account of the user acting as a second information interaction party to the first device.
2. The method of claim 1, wherein the identification information is uploaded by the first device, or generated locally.
3. The method of claim 1 or claim 2, further comprising:
 - receiving information to be interacted that is uploaded by the first device;
 - associatively storing the information to be interacted, the human biometric data, and the identification information; and
 - sending the information to be interacted corresponding to the identification information included in the request information to the user account upon receiving the request information.

4. An information interaction apparatus comprising:

a data receiving unit configured to receive, from a first device of a first information interaction party in an information operation, human biometric data of a user acting as a second information interaction party;

an association storage unit configured to associatively store the human biometric data and corresponding identification information of the user acting as a second information interaction party;

a request receiving unit configured to receive, from a second device of the user acting as a second information interaction party, request information from a user account of the user acting as a second information interaction party, the request information comprising the identification information;

an association processing unit configured to:

search for the human biometric data corresponding to the identification information included in the request information, and

establish an association relationship between the user account and the human biometric data that is found; and

an information sending unit configured to send information of the user account of the user acting as a second information interaction party to the first device.

5. The apparatus of claim 4, wherein the identification information is uploaded by the first device, or generated locally.

6. The apparatus of claim 4 or 5, wherein:

the data receiving unit further receives information to be interacted that is uploaded by the first device; and

the association storage unit further associatively stores the information to be interacted,

the human biometric data, and the identification information, wherein

the apparatus further comprises an information sending unit configured to send the information to be interacted corresponding to the identification information included in the request information to the user account when the request information is received.