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(57) Abstract: A user verifying method, a terminal device, a server and a storage medium are disclosed by the embodiments of the present invention. And the method of an embodiment comprises: receiving, by a terminal device, a motion instruction from a server, and displaying the motion instruction on a display interface of the terminal device; obtaining, by the terminal device, sensed data of a gyroscope equipped in the terminal device and sending, by the terminal device, the sensed data obtained by the terminal device; receiving, by the server, the sensed data sent by the terminal device; determining, by the server, whether a motion trail of the terminal device constructed according to the sensed data meets a requirement of the motion instruction; and determining, by the server, that a user of the terminal device passes a user verification if the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction, such that it is ensured that only human can accomplish the verifying process, which promotes the security of the user verification and improves the user experience.
USER VERIFYING METHOD, TERMINAL DEVICE, SERVER AND STORAGE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to a Chinese patent application No. 201310493355.4 filed on October 18, 2013 by Shenzhen Tencent Computer System Co., Ltd. and entitled "USER VERIFYING METHOD AND MOBILE TERMINAL", the content of which is incorporated herein by reference in its entirety.

Technical Field

The present disclosure relates to the field of communication technologies, and in particular to a user verifying method, a terminal device, a server and a storage medium.

Background

A Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) is a common completely automated program for determining whether a user is a computer or human. In the process of the CAPTCHA, a server automatically generates a question to be answered by the user. The question generated by the server is solvable by human only, but not by the computer, thus the user who solves the question is determined as human.

However, an Optical Character Recognition (OCR) technology has been developed by skilled persons as technologies develop. The Optical Character Recognition technology is utilized to analyze an image that is generated from scanning a document, to obtain information such as text contained in the image. Particularly, characters in the document are scanned by a digital scanning device such as a scanner and a digital camera to generate an image, then shapes of the characters are determined through distinguishing bright pixels and dark pixels in the image, and then the shapes of the characters are converted to corresponding computer texts by the Optical Character Recognition technology. Through the OCR technology, it is therefore possible for a computer to answer the question generated by the server.

In order to prevent a hacker from recognizing CAPTCHA codes and submitting answers by technologies such as the OCR technology, there is another type of existing CAPTCHA which provides a CAPTCHA image which is formed by lines and irregular
characters. In verifying a user, a CAPTCHA code in the form of an image is generated by a server according to a preset rule, sent to a terminal device, and displayed on a display interface of the terminal device; the user examines the CAPTCHA code, recognizes a character string comprised of digitals, English letters, Chinese characters or other characters contained in the image of the CAPTCHA code, and then fills in the recognized character string which is then submitted to the server for a user verification; and the server determines whether the submitted character string conforms to that contained in the image of the CAPTCHA code, and if the submitted character string conforms to that contained in the image, the user is determined as human, as illustrated in Figure 1 which is a schematic view showing the CAPTCHA code in the prior art a conventional method.

However, the CAPTCHA code in the form of the image comprised of lines and irregular characters is defective in the prior art. Once enough samples are collected by hackers, such CAPTCHA code in the form of the image may be recognized automatically by a computer program which is trained by means of the OCR technology. Even if such CAPTCHA code is optimized and improved, the CAPTCHA code will still be recognized automatically by the computer program as long as the number of images from a background image library for the CAPTCHA code is limited. Therefore, the security of the existing CAPTCHA code in the form of the image is unsatisfying.

Additionally, in order to promote the capability against the automatic recognition made by the computer program, the difficulty in recognizing such CAPTCHA code in the form of an image is increased, but at the same time the recognition by human users is affected as well and hence the user experience is degraded. Though such CAPTCHA code is always shown with a hint of "click to change CAPTCHA code" which can be clicked to get a new CAPTCHA code, the user experience is still poor due to the high recognition difficulty.

It is noted that this section provides background information related to the present disclosure which is not necessarily prior art.

**Summary**

In view of the above, embodiments of the present invention provide a user verifying method, a terminal device, a server and a storage medium, which are used to verify the user by a terminal device through indicating corresponding motion instruction to the user, to assure that only human can accomplish the verifying process, which promotes the security of the user verification and improves the user experience.

A user verifying method includes:

receiving, by a terminal device, a motion instruction from a server, and displaying
the motion instruction on a display interface of a terminal device;

obtaining sensed data of a gyroscope equipped in the terminal device and sending, by the terminal device, the sensed data obtained by the terminal device;

where the sensed data sent to the server is configured for the server to determine whether the motion trail of the terminal device meets a requirement of the motion instruction.

A user verifying method includes:

receiving, by a server, the sensed data of a terminal device sensed by a gyroscope equipped in the terminal device;

constructing a motion trail of the terminal device according to the sensed data;

determining whether the motion trail of the terminal device constructed according to the sensed data meets a requirement of the motion instruction; and

determining that a user of the terminal device passes a user verification if the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction.

A terminal device, comprises:

a receiving module, which is configured to receive a motion instruction from a server, and display the motion instruction on a display interface of the terminal device;

an obtaining module, which is configured to obtain sensed data of a gyroscope equipped in the terminal device after the motion instruction is received by the receiving module; and

a sending module, which is configured to send the sensed data obtained by the obtaining module to the server,

where the sensed data sent to the server is configured for the server to determine whether the motion trail of the terminal device meets a requirement of the motion instruction.

A server, comprises:

a receiving module, which is configured to receive sensed data of a terminal device sensed by a gyroscope equipped in the terminal device;

a determining module, which is configured to construct a motion trail of the terminal device according to the sensed data and determine whether the motion trail of the
terminal device meets a requirement of the motion instruction, after the sensed data is received by the receiving module; and

a second determining module, which is configured to determine that a user of the terminal device passes a user verification if the motion trail of the terminal device constructed according to the sensed data meeting the requirement of the motion instruction is determined by the determining module.

A non-transitory storage medium comprising computer-executable instructions, where the computer-executable instructions are configured to perform a user verifying method when being executed by a computer processor, and the method comprises:

receiving, by a terminal device, a motion instruction from a server, and displaying the motion instruction on a display interface of a terminal device;

obtaining sensed data of a gyroscope equipped in the terminal device and sending the sensed data obtained by the terminal device,

where the sensed data sent to the server is configured for the server to determine whether the motion trail of the terminal device meets a requirement of the motion instruction.

A non-transitory storage medium comprising computer-executable instructions, where the computer-executable instructions are configured to perform a user verifying method when being executed by a computer processor, and the method comprises:

receiving, by a server, the sensed data of a terminal device sensed by a gyroscope equipped in the terminal device;

constructing a motion trail of the terminal device according to the sensed data;

determining whether the motion trail of the terminal device meets a requirement of the motion instruction; and

determining that a user of the terminal device passes a user verification if the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction.

There are several advantages which can be seen from previous aspect of the present invention as followings:

After a motion instruction is received by the terminal device from the server, it is then displayed on the interface of the terminal, device to prompt the user to follow the motion instruction for verifying; the terminal device obtains the sensed data of the gyroscope equipped in the terminal device and sends the sensed data to the server; and the server
receives the sensed data from the terminal device and determines whether the motion trail of
the terminal device constructed according to the sensed data meets a requirement of the
motion instruction, and if the motion trail of the terminal device meets the requirement of the
motion instruction, the server determines that the user passes the user verification, such that
it is assured that only human can accomplish the verifying process, which promotes the
security of the user verification and improves the user experience.

**Brief Description of the Drawings**

Fig. 1 is a schematic view showing a CAPTCHA code in a conventional method;

Fig. 2 is a schematic diagram showing a flow chart of a user verifying method
according to an embodiment of the present invention;

Fig. 3 is a schematic diagram showing a flow chart of a user verifying method
according to another embodiment of the present invention;

Fig. 4 is a schematic view showing a terminal device and a server communicated
with the terminal device according to an embodiment of the present invention; and

Fig. 5 is a schematic view showing a terminal device and a server communicated
with the terminal device according to another embodiment of the present invention.

**Detailed Description of the Embodiments**

A user verifying method, a terminal device, a server and a storage medium
according to embodiments of the present invention are provided to verify a user via a
terminal device, where the user is requested to follow a corresponding motion instruction, to
ensure that only human can accomplish the motion instruction, thereby promoting the
security of the user verification and improving the user experience.

As illustrated in Figure 2, a user verifying method of an embodiment of the present
invention includes the following Steps 201 to 205.

At Step 201, a motion instruction is received by a terminal device from a server,
and displayed on a display interface of the terminal device.

In the above embodiment of the present invention, when a user is logging in to an
account via a terminal device, in order to make sure that the account is logged in by human,
a motion instruction is generated by a server and sent to the terminal device from the server.
Upon receiving the motion instruction from the server, the terminal device displays the
motion instruction on a display interface of the terminal device to prompt the user to follow the motion instruction, i.e. to perform a motion according to the motion instruction, for the purpose of verifying the user.

In embodiments of the present invention, the motion instruction generated by the server may include any one of: a shaking up and down instruction, a shaking left and right instruction, a tilting forward and backward instruction, a tilting left and right instruction, and a symbol stroke following instruction, or a combination of at least two of the above instructions.

At Step 202, sensed data of a gyroscope equipped in the terminal device is obtained by the terminal device and sent from the terminal device to the server.

In the embodiment of the present invention, the sensed data of the gyroscope equipped in the terminal device is obtained after the motion instruction is displayed on the interface of the terminal device and sent from the terminal device to the server, where the gyroscope is also referred to as an angular velocity sensor and is employed to sense a rotational angular velocity of an object in deflecting. Therefore, motions including rotation and deflection of the terminal device such as a mobile phone and a personal digital assistant can be well measured by a gyroscope equipped in the terminal device. The data measured by the gyroscope is also referred to as sensed data of the gyroscope, and additionally, the sensed data may be sent in real time to a processor inside the terminal device for processing. The sensed data sent to the server is configured for the server to determine whether the motion trail of the terminal device meets a requirement of the motion instruction.

In the above embodiment of the present invention, the sensed data of the gyroscope equipped in the terminal device may be obtained by the terminal device. The sensed data obtained by the terminal device may be sent to the server and analyzed by the server, to analyze the motion of the user holding the terminal device and determine the motion trail of the terminal device.

At Step 203, the server receives the sensed data sent by the terminal device, constructs a motion trail of the terminal device according to the sensed data and determines whether the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction, and if the motion trail of the terminal device meets the requirement of the motion instruction, the method proceeds with Step 204.

In the embodiment of the present invention, the server receives the sensed data sent by the terminal device, determines whether the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction, to verify whether the user passes the user verification.
At Step 204, the server determines that the user of the terminal device passes the user verification.

In the above embodiment of the present invention, if the server determines that the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction sent by the server, the server determines that the user of the terminal device (i.e. the user holding the terminal device) passes the user verification, i.e., it is confirmed that the user logging in to the account through the terminal device is human.

In the above embodiment of the present invention, if the server determines that the motion trail of the terminal device constructed according to the sensed data does not meet the requirement of the motion instruction sent by the server, Step 205 is performed, and at Step 205, the user verification of the user is determined as failed, and the user will be verified again if the number of failures of the user verification conducted on a user account of the user for verifying or conducted through the terminal device with the same Internet Protocol (IP) address is less than a preset value; or the user is allowed to be verified again after a preset period if the number of failures of the user verification conducted on the user account for verifying or conducted through the terminal device with the same IP address is equal to or more than the preset value.

In the above embodiment of the present invention, the motion instruction is received by the terminal device from the server and then displayed on the interface of the terminal device, to prompt the user to follow the motion instruction for verifying; the terminal device obtains the sensed data of the gyroscope equipped in the terminal device, and sends the sensed data to the server; and the server receives the sensed data from the terminal device and determines whether the motion trail of the terminal device constructed according to the sensed data meets a requirement of the motion instruction, and if the motion trail of the terminal device meets the requirement of the motion instruction, the server determines that the user passes the user verification. As such, both the security of the user verification and the user experience are improved.

In order to better understand the solution of the present disclosure, a user verifying method according to another embodiment of the present invention will be described below, as illustrated in Figure 3, and the method includes the following Steps 301 to 307

At Step 301, a motion instruction is received by a terminal device from a server, and displayed on a display interface of the terminal device.

Step 301 is as same as Step 201 described in the embodiment illustrated in Figure 1, and thus will not be repeatedly described here.
At Step 302, sensed data of a gyroscope equipped in the terminal device within a preset period is obtained by the terminal device and sent from the terminal device to the server.

In the embodiment of the present invention, the sensed data of the gyroscope within the preset period is obtained by the terminal device and sent to the server, after the motion instruction is received by the terminal device and displayed on the interface of the terminal device.

The preset period may be a default period set in the terminal device, and is advantageous to prevent the terminal device from obtaining excessive sensed data which is irrelative to the motion instruction and to avoid too much data to be processed by the terminal device. The sensed data within the preset period may be obtained by the terminal device and the motion trail of the terminal device is constructed by analyzing the sensed data of the gyroscope within the preset period, to effectively reduce the load of data processing in the terminal device, and reduce the interference caused by user motions irrelative to the motion instruction.

Or, after the motion instruction is displayed on the interface of the terminal device, the terminal device is moved by the user according to the motion instruction, such as shaken left and right; after the shaking of the terminal device is completed, a button on the display interface is clicked by the user to indicate that the motion of the terminal device made by the user is completed, and sensed data of the gyroscope within a period, which is from the time when the motion instruction is displayed by the terminal device to the time when the user clicks the button to indicate that the motion of the terminal device is completed, is obtained in response to the user operation of clicking the button, and the period may be regarded as the preset period.

Or, after the motion instruction is displayed on the interface of the terminal device, and before the terminal device is moved by the user according to the motion instruction, a start button on the display interface is clicked by the user and then the terminal device is moved by the user according to the motion instruction. After the motion instruction has been completed by the user, an end button on the display interface is clicked by the user to confirm the completion of the motion instruction, and the sensed data of the gyroscope within a period between the time when the start button is clicked and the time when the end button is clicked, and the period may be regarded as the preset period.

At Step 303, the sensed data sent by the terminal device is received by the server and a motion trail of the terminal device is constructed from the sensed data of the gyroscope by the server, then the method proceeds with Step 304 or Step 305.

In the embodiment of the present invention, the sensed data sent by the terminal
device is received by the server and the motion trail of the terminal device sensed by the gyroscope is constructed from the sensed data of the gyroscope in the terminal device.

The gyroscope equipped in the terminal device is a three-axis gyroscope, which is also referred to as micro-electromechanical gyroscope. A micro magnetic body is arranged in the three-axis gyroscope and may be moved in 3 directions (i.e. an X axis, a Y axis and a Z axis of a coordinate system) in space under the effect of a Coriolis force generated when the terminal device is moving, the movement direction and acceleration of the micro magnetic body is recorded when the terminal device is moving, and such data detected by the gyroscope is converted to sensed data interpretable by the terminal device such that the motion trail of the terminal device may be constructed from the sensed data of the gyroscope. The sensed data sent to the server is configured for the server to determine whether the motion trail of the terminal device meets a requirement of the motion instruction.

At Step 304, the server determines whether the motion trail of the terminal device is identical to that as instructed by the motion instruction, and if the motion trail of the terminal device is identical to that as instructed by the motion instruction, Step 306 is performed.

At Step 305, the server determines whether the motion trail of the terminal device includes a motion trail of the terminal device as instructed by the motion instruction, and if the motion trail of the terminal device includes a motion trail of the terminal device as instructed by the motion instruction, Step 306 is performed.

In the above embodiment of the present invention, it is determined whether the motion trail of the terminal device that is constructed from the sensed data of the gyroscope is identical to that as instructed by the motion instruction, or it is determined whether the motion trail of the terminal device that is constructed from the sensed data of the gyroscope includes a motion trail of the terminal device as instructed by the motion instruction, and the corresponding subsequent step is performed according to the result of the determination.

At Step 306, the server determines that the user passes the user verification.

In the above embodiment of the present invention, if the constructed motion trail of the terminal device is identical to that as instructed by the motion instruction or the constructed motion trail of the terminal device includes the motion trail of the terminal device as instructed by the motion instruction, the server determines that the user passes the user verification and is human, i.e., the user who is logging in to the account through the terminal device is determined as human.

It is noted that, in the present embodiment, if the constructed motion trail of the terminal device is not identical to that as instructed by the motion instruction or the
constructed motion trail of the terminal device does not include the motion trail of the terminal device as instructed by the motion instruction, Step 307 is performed, and at Step 307 the server determines that the user fails to pass the user verification.

In the above embodiment of the present invention, the motion instruction received by the terminal device from the server is displayed on the display interface of the terminal device to prompt the user to follow the motion instruction for verifying; then, sensed data of a gyroscope equipped in the terminal device within a preset period is obtained by the terminal device and sent to the server, the motion trail of the terminal device is constructed from the sensed data of the gyroscope by the server which receives the sensed data sent by the terminal device; and then and the server determines whether the received motion trail is identical to that as instructed by the motion instruction or whether the received motion trail includes a motion trail of the terminal device as instructed by the motion instruction, and if so, the server determines that the user passes the user verification, such that it is ensured that only human can accomplish the verifying process, which promotes the security of the user verification and improves the user experience.

As illustrated in figure 4, a terminal device 400a of an embodiment of the present invention includes:

a receiving module 401, which is configured to receive a motion instruction sent by a server 400b, and display the motion instruction on a display interface;

an obtaining module 402, which is configured to obtain sensed data of a gyroscope equipped in the terminal device 400a after the motion instruction is received by the receiving module 401;

a sending module 405, which is configured to send the sensed data obtained by the obtaining module 402 to the server 400b,

where the sensed data sent to the server is configured for the server to determine whether the motion trail of the terminal device meets a requirement of the motion instruction.

And as illustrated in Figure 4, a server 400b of an embodiment of the present invention includes:

a receiving module 406, which is configured to receive sensed data of a terminal device 400a sensed by a gyroscope equipped in the terminal device 400a;

a determining module 403, which is configured to construct a motion trail of the terminal device according to the sensed data and determine whether a motion trail of the terminal device 400a constructed according to the sensed data meets the requirement of the
motion instruction, after the sensed data is received by the receiving module 406;

   a second determining module 404, which is configured to determine that a user of
the terminal device 400a passes a user verification if the motion trail of the terminal device
400a constructed according to the sensed data meeting the requirement of the motion
instruction is determined by the determining module 403.

   In the above embodiment of the present invention, the receiving module 401 of the
terminal device 400a receives a motion instruction sent by a server and displays the motion
instruction on a display interface of the terminal device 400a; the obtaining module 402
obtains sensed data of a gyroscope equipped in the terminal device and the sending module
405 sends the sensed data to the server 400b; and then the receiving module 406 of the
server 400b receives the sensed data sent by the sending module 405 of the terminal device
400a and the determining module 403 determines whether a motion trail of the terminal
device constructed according to the sensed data meets the requirement of the motion
instruction; the second determining module 404 determines that a user of the terminal device
400a passes a user verification if the motion trail of the terminal device 400a constructed
according to the sensed data meeting the requirement of the motion instruction is determined
by the determining module 403.

   In the above embodiment of the present invention, the motion instruction is
received by the terminal device from the server and then displayed on the interface of the
terminal device, to prompt the user to follow the motion instruction for verifying; the
terminal device obtains the sensed data of the gyroscope equipped in the terminal device,
and sends the sensed data to the server; and the server receives the sensed data from the
terminal device and determines whether the motion trail of the terminal device constructed
according to the sensed data meets a requirement of the motion instruction, and if the motion
trail of the terminal device meets the requirement of the motion instruction, the server
determines that the user passes the user verification. As such, both the security of the user
verification and the user experience are improved.

   As illustrated in figure 5, a terminal device 400a according to an embodiment of
the present includes: a receiving module 401, an obtaining module 402, and a sending
module 405 as illustrated in figure 4, and a server 400b according to the embodiment of the
present includes: a receiving module 406, a determining module 403 and a second
determining module 404 as illustrated in figure 4, where each of modules is functioning as
same as the corresponding module in Figure 4 with same name and will not be repeatedly
.described.

   In the above embodiment of the present invention, the obtaining module 402 is
particularly configured to obtain sensed data of a gyroscope equipped in the terminal device
within a preset period.
In the above embodiment of the present invention, the determining module 403 comprises:

a first determining unit 502, which is configured to determine whether the constructed motion trail is identical to a motion trail of the terminal device as instructed by the motion instruction.

Or, in the above embodiment of the present invention, the determining module 403 comprises:

a second determining unit 504, which is configured to determine whether the constructed motion trail includes a motion trail of the terminal device as instructed by the motion instruction.

In the above embodiment of the present invention, the motion instruction may include any one of: a shaking up and down instruction, a shaking left and right instruction, a tilting forward and backward instruction, a tilting left and right instruction, and a symbol stroke following instruction, or a combination of at least two of the above instructions.

In the above embodiment of the present invention, the receiving module 401 of the terminal device 400a receives a motion instruction sent by a server and displays it on a display interface of the terminal device 400a; the obtaining module 402 obtains sensed data of a gyroscope equipped in the terminal device within a preset period and the sending module 405 sends the sensed data to the server 400b; and then the receiving module 406 of the server 400b receives the sensed data sent by the sending module 405 of the terminal device 400a and the determining module 403 determines whether a motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction, where the determining module 403 constructs the motion trail of the terminal device according to the sensed data of the gyroscope and the first determining unit 502 determines whether the constructed motion trail is identical to a motion trail of the terminal device as instructed by the motion instruction, or the determining module 403 constructs the motion trail of the terminal device according to the sensed data of the gyroscope and the second determining unit 504 determines whether the constructed motion trail includes a motion trail of the terminal device as instructed by the motion instruction; and then the second determining module 404 determines that a user of the terminal device 400a passes the user verification if the motion trail of the terminal device 400a constructed according to the sensed data meeting the requirement of the motion instruction is determined by the determining module 403.

In the above embodiment of the present invention, the motion instruction received by the terminal device from the server is displayed on the display interface of the terminal device to prompt the user to follow the motion instruction for verifying; then, sensed data of
a gyroscope equipped in the terminal device within a preset period is obtained by the
terminal device and sent to the server, the motion trail of the terminal device is constructed
from the sensed data of the gyroscope by the server which receives the sensed data sent by
the terminal device; and then and the server determines whether the received motion trail is
identical to that as instructed by the motion instruction or whether the received motion trail
includes a motion trail of the terminal device as instructed by the motion instruction, and if
so, the server determines that the user passes the user verification, such that it is ensured that
only human can accomplish the verifying process, which promotes the security of the user
verification and improves the user experience.

In light of the description of the above embodiments, it should be understood by
the skilled person in the art that the present invention can be embodied by software and the
necessary universal hardware, or merely hardware, but mostly the former is a preferable
embodiment. Based on this understanding, the technical solution of the present invention
may be substantially embodied in a software product or a part of the technical solution that
contributes to the prior art may be embodied in a software product, and the computer
software can be stored in the storage medium which may be a floppy disk, a Read-only
Memory, a Random Access Memory, a Flash, a hard disk, an optical disk and the like,
instructions included in the software product are configured to instruct a computer device
(such as a personal computer, a server or a network device) to execute the method described
in the embodiments of the present invention. A non-transitory storage medium including
computer-executable instructions is provided by the present invention, where the
computer-executable instructions are configured to perform a user verifying method, and the
method includes: receiving, by a terminal device, a motion instruction from a server, and
displaying the motion instruction on a display interface of a terminal device; obtaining
sensed data of a gyroscope equipped in the terminal device and sending the sensed data
obtained by the terminal device, where the sensed data sent to the server is configured for the
server to determine whether the motion trail of the terminal device meets a requirement of
the motion instruction. Another non-transitory storage medium including
computer-executable instructions is provided by the present invention, where the
computer-executable instructions are configured to perform a user verifying method, and the
method includes: receiving, by a server, the sensed data of a gyroscope equipped in a
terminal device sent by the terminal device; constructing a motion trail of the terminal device
according to the sensed data and determining whether the motion trail of the terminal device
constructed according to the sensed data meets a requirement of the motion instruction; and
determining that a user of the terminal device passes the user verification if the motion trail
of the terminal device constructed according to the sensed data meets the requirement of the
motion instruction.

A user verifying method, a terminal device, a server and a storage medium
according to the present invention are described above. And modifications can be made in accordance with the embodiments and application scope according to the concept of the present invention by the skilled person in the prior art. After all, the present description is not a limitation of the present invention.
CLAIMS

1. A user verifying method, comprising:

   receiving by a terminal device, a motion instruction from a server,

   displaying the motion instruction on a display interface of the terminal device; and

   obtaining sensed data of a gyroscope equipped in the terminal device and sending the
   sensed data obtained by the terminal device to a server;

   wherein the sensed data sent to the server is configured for the server to determine
   whether a motion trail of the terminal device meets a requirement of the motion instruction.

2. The method according to claim 1, wherein obtaining sensed data of the gyroscope
   equipped in the terminal device comprises:

   obtaining the sensed data of the gyroscope equipped in the terminal device within a
   preset period.

3. The method according to claim 1, wherein the motion instruction is any one from a
   group consisting of: a shaking up and down instruction, a shaking left and right instruction, a
   tilting forward and backward instruction, a tilting left and right instruction, and a symbol
   stroke following instruction, or a combination of at least two thereof.

4. A user verifying method, comprising:

   receiving, by a server, the sensed data of a terminal device sensed by a gyroscope
   equipped in the terminal device;

   constructing a motion trail of the terminal device according to the sensed data;

   determining whether the motion trail of the terminal device meets a requirement of a
   motion instruction; and

   determining that a user of the terminal device passes a user verification if the motion
   trail of the terminal device constructed according to the sensed data meets the requirement of
   the motion instruction.

5. The method according to claim 4, wherein determining whether a motion trail of the
   terminal device constructed according to the sensed data meets the requirement of the
   motion instruction comprises:

   determining whether the constructed motion trail is identical to a motion trail of the
   terminal device as instructed by the motion instruction.

6. The method according to claim 4 or 5, wherein determining whether the motion trail of
   the terminal device constructed according to the sensed data meets the requirement of the
motion instruction comprises:

determining whether the constructed motion trail comprises a motion trail of the terminal device as instructed by the motion instruction.

7. A terminal device, comprising:

   a receiving module, which is configured to receive a motion instruction from a server, and display the motion instruction on a display interface of the terminal device;

   an obtaining module, which is configured to obtain sensed data of a gyroscope equipped in the terminal device after the motion instruction is received by the receiving module; and

   a sending module, which is configured to send the sensed data obtained by the obtaining module to the server,

   wherein the sensed data sent to the server is configured for the server to determine whether a motion trail of the terminal device meets a requirement of the motion instruction.

8. The terminal device according to claim 7, wherein, the obtaining module is particularly configured to obtain the sensed data of the gyroscope equipped in the terminal device within a preset period.

9. The terminal device according to claim 7, wherein the motion instruction is any one from a group consisting of: a shaking up and down instruction, a shaking left and right instruction, a tilting forward and backward instruction, a tilting left and right instruction, and a symbol stroke following instruction, or a combination of at least two thereof.

10. A server, comprising:

    a receiving module, which is configured to receive sensed data of a terminal device sensed by a gyroscope equipped in the terminal device;

    a determining module, which is configured to construct a motion trail of the terminal device according to the sensed data and determine whether the motion trail of the terminal device meets a requirement of the motion instruction, after the sensed data is received by the receiving module; and

    a second determining module, which is configured to determine that a user of the terminal device passes a user verification if the motion trail of the terminal device constructed according to the sensed data meeting the requirement of the motion instruction is determined by the determining module.

11. The terminal device according to claim 10, wherein the determining module comprises:

    a first determining unit, which is configured to determine whether the constructed motion trail is identical to a motion trail of the terminal device as instructed by the motion
12. The terminal device according to claim 10, wherein the determining module comprises:

a second determining unit, which is configured to determine whether constructed motion trail is identical to a motion trail of the terminal device as instructed by the motion instruction.

13. A non-transitory storage medium comprising computer-executable instructions, wherein the computer-executable instructions are configured to perform a user verifying method when being executed by a computer processor, and the method comprises:

   receiving, by a terminal device, a motion instruction from a server, and displaying the motion instruction on a display interface of the terminal device; and

   obtaining sensed data of a gyroscope equipped in the terminal device and sending, by the terminal device, the sensed data obtained by the terminal device;

   wherein the sensed data sent to the server is configured for the server to determine whether a motion trail of the terminal device meets a requirement of the motion instruction.

14. A non-transitory storage medium comprising computer-executable instructions, wherein the computer-executable instructions are configured to perform a user verifying method when being executed by a computer processor, and the method comprises:

   receiving, by a server, the sensed data of a terminal device sensed by a gyroscope equipped in the terminal device;

   constructing a motion trail of the terminal device according to the sensed data;

   determining whether the motion trail of the terminal device meets a requirement of the motion instruction; and

   determining that a user of the terminal device passes a user verification if the motion trail of the terminal device constructed according to the sensed data meets the requirement of the motion instruction.
Receiving, by a terminal, a motion instruction from a server, and displaying the motion instruction on a display interface of the terminal

Obtaining, by the terminal, sensed data of a gyroscope equipped in the terminal and sending the sensed data from the terminal to the server

Receiving, by the server, the sensed data sent by the terminal and determining, by the server, whether the motion trail of the terminal constructed according to the sensed data meets the requirement of the motion instruction

Determining, by the server, that the user of the terminal passes a user verification

Determining, by the server, that the user of the terminal fails to pass a user verification

Figure 1

Figure 2
Figure 5
A. **CLASSIFICATION OF SUBJECT MATTER**

H04L 9/32 (2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. **FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

H04L; G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT,CNKI,WPI,EPODOC: validate, log on, motion, sense, trail, up, down, left, right, shake, tilt

C. **DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C.  

See patent family annex.

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Date of the actual completion of the international search: 15 December 2014  
Date of mailing of the international search report: 03 February 2015

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