

[Document Name] DESCRIPTION

[Title of Invention] AUTHENTICATION SYSTEM, METHOD, AND

COMPUTER-READABLE RECORDING MEDIUM~~PROGRAM~~

[Technical Field]

5 [0001]

The present ~~invention~~disclosure relates to an authentication system, a method, and a program.

[Background Art]

[0002]

10 Services using face authentication have started to spread. For example, face authentication has started to be applied to various procedures (for example, check in, baggage check, security check, and the like) at airports.

[0003]

15 For example, PTL 1 discloses a configuration in which a flow of a series of procedures from check in to boarding is performed by a passenger himself/herself in a security booth. In the technique disclosed in PTL 1, traceability check of passengers is performed by a network camera installed in an airport. In the traceability check, an image of the
20 passenger captured by the network camera in any place in the airport is collated with an image including a face image of the passenger stored as personal authentication information. The behavior of the passenger is tracked and managed by position information of the network camera installation place and timestamp of the captured image.

25 [Citation List]

[Patent Literature]

[0004]

[PTL 1] WO 2005/055151

[Summary~~-of Invention~~]

[Technical Problem]

[0005]

As described above, a face authentication system has been started to be applied to various procedures in the airport. Here, not all of
5 airport users use the face authentication system, and a certain percentage of the users do not use the face authentication system at present. Therefore, all of terminals installed in the various procedures cannot support the face authentication.

[0006]

10 Therefore, it is conceivable that the terminal set in each area where the procedure is performed supports both the procedure using a face authentication function and the procedure not using the face authentication. That is, it is conceivable to install a hybrid terminal having both the face authentication function and a conventional procedure
15 function. In this case, if the user of the face authentication system passes in front of the terminal (hybrid terminal), the procedure ends, but the non-user of the face authentication system performs identify authentication using a passport or the like on the same terminal.

[0007]

20 By such a measure (introduction of the hybrid terminal having the two functions), it is possible to cope with a mixture of the system user and the non-user, but there is also an aspect that the system user and the non-user line up in the same terminal, and the convenience of the face authentication system is impaired.

25 [0008]

A main object of the present ~~invention-disclosure~~ is to provide an authentication system, a method, and a program that contribute to improving convenience of a user.

[Solution to Problem]

[0009]

According to the first aspect of the present ~~invention~~disclosure, there is provided an authentication system including: at least one or more first terminals capable of providing a service by a biometric authentication function or a non-biometric authentication function; a plurality of second terminals each capable of switching a biometric authentication function and a non-biometric authentication function and capable of providing a service by the biometric authentication function or the non-biometric authentication function; and a server device connected to the at least one or more first terminals and the plurality of second terminals, in which the server device calculates a use rate of the biometric authentication function in the at least one or more first terminals, and determines an operation mode of at least one or more second terminals among the plurality of second terminals in accordance with the calculated use rate.

[0010]

According to the second aspect of the present ~~invention~~disclosure, there is provided a method including: in an authentication system including at least one or more first terminals capable of providing a service by a biometric authentication function or a non-biometric authentication function, a plurality of second terminals each capable of switching a biometric authentication function and a non-biometric authentication function and capable of providing a service by the biometric authentication function or the non-biometric authentication function, and a server device connected to the at least one or more first terminals and the plurality of second terminals, calculating a use rate of the biometric authentication function in the at least one or more first terminals; and determining an operation mode of at least one or more second terminals among the plurality of second terminals in accordance with the calculated use rate.

[0011]

According to the third aspect of the present ~~invention~~disclosure, there is provided a non-transitory computer-readable recording medium recording a program for causing a computer mounted on a server device connected to at least one or more first terminals and a plurality of second terminals to execute: the at least one or more first terminals capable of providing a service by a biometric authentication function or a non-biometric authentication function, and the plurality of second terminals each capable of switching a biometric authentication function and a non-biometric authentication function and capable of providing a service by the biometric authentication function or the non-biometric authentication function, processing of calculating a use rate of the biometric authentication function in the at least one or more first terminals; and processing of determining an operation mode of at least one or more second terminals among the plurality of second terminals in accordance with the calculated use rate.

[Advantageous Effects of Invention]

[0012]

According to each aspect of the present ~~invention~~disclosure, an authentication system, a method, and a program that contribute to improving convenience of a user are provided. The effect of the present ~~disclosure~~invention is not limited to the above. According to the present ~~disclosure~~invention, other effects may be exhibited instead of or in addition to the effect.

[Brief Description of Drawings]

[0013]

Fig. 1 is a diagram for describing an outline of an example embodiment.

Fig. 2 is a diagram illustrating an example of a schematic

that communicates with another device. For example, the communication interface 314 includes a network interface card (NIC) or the like.

[0102]

5 The functions of the server device 30 are implemented by various processing modules. The processing modules are implemented by, for example, the processor 311 executing a program stored in the memory 312. Furthermore, the program can be recorded in a computer-readable storage medium. The storage medium may be a non-transient (non-
10 transitory) medium such as a semiconductor memory, a hard disk, a magnetic recording medium, or an optical recording medium. That is, the present ~~invention~~disclosure can also be embodied as a computer program product. In addition, the program can be downloaded via a network or updated using a storage medium storing the program. Further,
15 the processing module may be implemented by a semiconductor chip.

[0103]

 The first terminal 10 and the second terminal 20 can also be configured by an information processing device similarly to the server device 30, and since there is no difference in the basic hardware
20 configuration from the server device 30, the description thereof will be omitted. The first terminal 10 and the second terminal 20 may include a camera device (camera module) or the like as necessary.

[0104]

[Modification]

25 Note that the configuration, operation, and the like of the authentication system described in the above example embodiments are merely examples, and are not intended to limit the configuration and the like of the system.

[0105]

but the execution order of the steps executed in the example embodiments is not limited to the described order. In the example embodiments, for example, the order of the illustrated steps can be changed in a range including no trouble in terms of content, such as executing the processes in parallel.

5 [0115]

The above example embodiments have been described in detail in order to facilitate understanding of the present disclosure, and it is not intended that all the configurations described above are necessary. In addition, in the case where a plurality of example embodiments has been
10 described, the example embodiment may be used alone or in combination. For example, a part of the configuration of the example embodiment can be replaced with the configuration of another example embodiment, or the configuration of another example embodiment can be added to the configuration of the example embodiment. Furthermore, another
15 configuration may be added to, deleted from, or replaced with another configuration a part of the configuration of the example embodiment.

[0116]

Although the industrial applicability of the present
| ~~invention~~disclosure is apparent from the above description, the present
20 ~~invention~~disclosure is suitably applicable to an authentication system and the like in an airport.

[0117]

Some or all of the above example embodiments can be described as but are not limited to the following supplementary notes.

25 [Supplementary Note 1]

An authentication system including:

at least one or more first terminals (10 or 101) capable of providing a service by a biometric authentication function or a non-biometric authentication function;

a plurality of second terminals (20 or 102) each capable of switching a biometric authentication function and a non-biometric authentication function and capable of providing a service by the biometric authentication function or the non-biometric authentication function; and

a server device (30 or 103) connected to the at least one or more first terminals (10 or 101) and the plurality of second terminals (20 or 102), wherein

the server device (30 or 103)
calculates a use rate of the biometric authentication function in the at least one or more first terminals (10 or 101), and
determines an operation mode of at least one or more second terminals among the plurality of second terminals (20 or 102) in accordance with the calculated use rate.

[Supplementary Note 2]

The authentication system according to ~~claim~~supplementary note 1, in which the server device (30 or 103) determines the number of second terminals that provides the service by the biometric authentication function among the plurality of second terminals (20 or 102).

[Supplementary Note 3]

The authentication system according to supplementary note 1 or 2, in which the server device (30 or 103)

selects a second terminal that requires switching between the biometric authentication function and the non-biometric authentication function among the plurality of second terminals (20 or 102) in accordance with the use rate, and transmits a setting switching notification to the selected second terminal (20 or 102).

[Supplementary Note 4]

The authentication system according to any one of supplementary

[0118]

The disclosures of the cited prior art documents are incorporated herein by reference. Although the example embodiments of the present ~~invention~~disclosure have been described, the present ~~invention~~disclosure is not limited to these example embodiments. It will be understood by those skilled in the art that these example embodiments are exemplary only and that various modifications are possible without departing from the scope and spirit of the present ~~invention~~disclosure. That is, it goes without saying that the present ~~invention~~disclosure includes various modifications and corrections that can be made by those skilled in the art in accordance with the entire disclosure including the claims and the technical idea.

[Reference signs List]

[0119]

10, 10-1 to 10-3, 101 First terminal

15 20, 20-1 to 20-3, 102 Second terminal

30, 103 Server device

40, 40-1 to 40-K Camera device

201, 301, 401 Communication control unit

202, 302 Terminal function implementation unit

20 203 Processing information generation unit

204, 304, 404 Storage unit

303 Operation mode switching unit

311 Processor

312 Memory

25 313 Input/output interface

314 Communication interface

402 Face authentication use rate calculation unit

403 Operation mode determination unit

405 Image analysis unit

[Document Name] CLAIMS

[Claim 1]

An authentication system comprising:

at least one or more first terminals capable of providing a service
5 by a biometric authentication function or a non-biometric authentication
function;

a plurality of second terminals each capable of switching a
biometric authentication function and a non-biometric authentication
function and capable of providing a service by the biometric
10 authentication function or the non-biometric authentication function; and
a server device connected to the at least one or more first terminals
and the plurality of second terminals, wherein

the server device
calculates a use rate of the biometric authentication function in the
15 at least one or more first terminals, and
determines an operation mode of at least one or more second
terminals among the plurality of second terminals in accordance with the
calculated use rate.

[Claim 2]

20 The authentication system according to claim 1, wherein the server
device determines the number of second terminals that provides the
service by the biometric authentication function among the plurality of
second terminals.

[Claim 3]

25 The authentication system according to claim 1 or 2, wherein the
server device

selects a second terminal, in accordance with the use rate, that
requires switching between the biometric authentication function and the
non-biometric authentication function among the plurality of second

terminals, and

transmits a setting switching notification to the selected second terminal.

[Claim 4]

5 The authentication system according to any one of claims 1 to 3, wherein

a plurality of the first terminals is included, and
each of the plurality of first terminals generates processing
information including the number of users for which the service by the
10 biometric authentication function has been provided or the number of
users for which the service by the non-biometric authentication function
has been provided, per unit time.

[Claim 5]

The authentication system according to claim 4, wherein each of
15 the plurality of first terminals transmits the processing information to the
server device.

[Claim 6]

The authentication system according to claim 5, wherein the server
device calculates the processing information acquired from each of the
20 plurality of first terminals and calculates the use rate.

[Claim 7]

The authentication system according to claim 6, wherein the server
device calculates the use rate in accordance with a total number of users
processed per unit time by the first terminal that provides the service by
25 the biometric authentication function among the plurality of first
terminals and a total number of users processed per unit time by the first
terminal that provides the service by the non-biometric authentication
function among the plurality of first terminals.

[Claim 8]

The authentication system according to claim 7, wherein the server device calculates the use rate by dividing a total number of users for which the service by the biometric authentication function has been provided by a sum total number, the sum total number being a sum of the total number of users for which the service by the biometric authentication function has been provided and a total number of users for which the service by the non-biometric authentication function has been provided.

[Claim 9]

The authentication system according to any one of claims 1 to 8, wherein the plurality of second terminals are terminals installed at a subsequent stage of the at least one or more first terminals.

[Claim 10]

The authentication system according to any one of claims 1 to 9, wherein the at least one or more first terminals are terminals that execute processing related to a check-in procedure.

[Claim 11]

The authentication system according to any one of claims 1 to 10, wherein the plurality of second terminals are terminals that execute processing related to a security check.

[Claim 12]

A method comprising:

in an authentication system including

at least one or more first terminals capable of providing a service

by a biometric authentication function or a non-biometric authentication function,

a plurality of second terminals each capable of switching a biometric authentication function and a non-biometric authentication function and capable of providing a service by the biometric

authentication function or the non-biometric authentication function, and
a server device connected to the at least one or more first terminals
and the plurality of second terminals,
calculating a use rate of the biometric authentication function in
5 the at least one or more first terminals; and
determining an operation mode of at least one or more second
terminals among the plurality of second terminals in accordance with the
calculated use rate.

[Claim 13]

10 A non-transitory computer-readable recording medium recording a
program for causing a computer mounted on a server device connected to
at least one or more first terminals and a plurality of second terminals to
execute:

15 the at least one or more first terminals capable of providing a
service by a biometric authentication function or a non-biometric
authentication function, and

the plurality of second terminals each capable of switching a
biometric authentication function and a non-biometric authentication
function and capable of providing a service by the biometric
20 authentication function or the non-biometric authentication function,
processing of calculating a use rate of the biometric authentication
function in the at least one or more first terminals; and
processing of determining an operation mode of at least one or
more second terminals among the plurality of second terminals in
25 accordance with the calculated use rate.