DESCRIPTION

Title of Invention

AUTHENTICATION DEVICE, AUTHENTICATION METHOD, AUTHENTICATION SYSTEM, AND PROGRAM

Technical Field

[0001] The present disclosure relates to an authentication apparatus, an authentication method, an authentication system, and a program.

Background Art

[0002] There is known a technique of using face authentication to manage entry and exit of a person passing through a gate apparatus installed at a train station, an airport, or the like. For example, Patent Literature (hereinafter referred to as "PTL") 1 discloses a gate apparatus capable of performing face authentication of a person who comes into the gate apparatus (hereinafter, such a person may be referred to as "incoming person") based on a facial feature value registered in association with an identifier transmitted by a wireless tag possessed by the incoming person.

Citation List

Patent Literature

[0003]

PTL 1

Japanese Patent No. 6816821

Summary

[0003a] In one aspect, the present disclosure refers to an authentication apparatus,

comprising, a processor that performs processing of associating, in a case where a portable terminal is present near a gate apparatus, registration information with one registered face image of a plurality of registered face images, the registration information indicating a user of the portable terminal, and an authenticator that prioritizes, in authentication processing of authenticating an incoming person who comes into the gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation results between face image information of the incoming person and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information.

[0003b] In another aspect, the present disclosure refers to an authentication method, comprising, performing processing of associating, in a case where a portable terminal is present near a gate apparatus, registration information with one registered face image of a plurality of registered face images, the registration information indicating a user of the portable terminal, and prioritizing, in authentication processing of authenticating an incoming person who comes into the gate apparatus based on a score which is a value

indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation result between face image information of the incoming person and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information.

[0003c] In yet another aspect, the present disclosure refers to an authentication system, comprising, a gate apparatus that allows an incoming person to come into the gate apparatus, an image-capturing apparatus that is provided corresponding to the gate apparatus and captures face image information of the incoming person, a beacon apparatus that is provided corresponding to the gate apparatus and transmits beacon information to a portable terminal, and an authentication apparatus that associates registration information with one registered face image of a plurality of registered face images in response to reception of the beacon information by the portable terminal, the registration information indicating a user of the portable terminal, the authentication apparatus prioritizing, in authentication processing of authenticating an incoming person who comes into the gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to

each of the plurality of registered face images are an identical person and corresponds to a collation result between the face image information and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information.

[0003d] In yet another aspect, the present disclosure refers to a program to be executed by a computer of a portable terminal to control the portable terminal, the portable terminal being used together with an authentication apparatus, the authentication apparatus performing actions comprising, performing processing of associating registration information with one registered face image of a plurality of registered face images, the registration information indicating a user of the portable terminal, and prioritizing, in authentication processing of authenticating an incoming person who comes into a gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation result between face image information of the incoming person and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming

person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information, and the program causing, in a case where beacon information is received, the computer of the portable terminal to execute processing of controlling such that the beacon information and the registration information are transmitted.

Technical Problem

CLAIMS

Claim 1 An authentication apparatus, comprising:

a processor that performs processing of associating, in a case where a portable terminal is present near a gate apparatus, registration information with one registered face image of a plurality of registered face images, the registration information indicating a user of the portable terminal; and

an authenticator that prioritizes, in authentication processing of authenticating an incoming person who comes into the gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation result between face image information of the incoming person and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information.

Claim 2 The authentication apparatus according to claim 1, wherein:

the authenticator extracts authentication candidates according to the scores, and

in a case where the registered face image associated with the registration information is not included in the authentication candidates, the authenticator performs the authentication processing without prioritizing the collation result between the registered face image associated with the registration information and the face image information of the incoming person.

Claim 3 The authentication apparatus according to claim 1, wherein in a case where a score difference is equal to or greater than a predetermined threshold, the authenticator performs the authentication processing without performing the predetermined addition processing on the score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, the score difference being a difference between a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person and a score corresponding to the collation result between the registered face image not associated with the registration information and the face image information of the incoming person.

Claim 4 The authentication apparatus according to claim 3, wherein the authenticator configures the predetermined threshold to be larger as a level of the score is lower.

Claim 5 The authentication apparatus according to claim 1, further comprising a recorder that records a number of times or frequency of each of the plurality of registered face images being associated with the registration information, wherein

the authenticator determines, in the authentication processing, the registered face image in the collation result between the registered face image associated with the registration information and the face image information of the incoming person, according

to the number of times or frequency, the collation result being prioritized.

Claim 6 The authentication apparatus according to claim 5, wherein:

the recorder further records a location of the gate apparatus that causes the registration information to be associated with the registered face image, and

the authenticator determines, in the authentication processing, the registered face image in the collation result between the registered face image associated with the registration information and the face image information of the incoming person, according to the number of times or frequency at a location identical to the location of the gate apparatus into which the incoming person attempts to come, the collation result being prioritized.

Claim 7 The authentication apparatus according to claim 1, wherein the processor performs processing of associating the registration information and the one registered face image of the plurality of registered face images in response to reception of beacon information from a beacon apparatus by the portable terminal, the beacon apparatus being provided corresponding to the gate apparatus.

Claim 8 The authentication apparatus according to claim 1, wherein:

the registration information is a registration number of the user of the portable terminal, the registration number being registered in an application of an authentication system, the application being installed into the portable terminal, and

the plurality of registered face images is face images of persons authorized to enter and exit a facility, the face images being registered in the authentication system, the facility being a facility at which the gate apparatus is disposed.

Claim 9 An authentication method, comprising:

performing processing of associating, in a case where a portable terminal is present near a gate apparatus, registration information with one registered face image of a plurality of registered face images, the registration information indicating a user of the portable terminal; and

prioritizing, in authentication processing of authenticating an incoming person who comes into the gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation result between face image information of the incoming person and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information.

Claim 10 An authentication system, comprising:

a gate apparatus that allows an incoming person to come into the gate apparatus;

an image-capturing apparatus that is provided corresponding to the gate apparatus and captures face image information of the incoming person;

a beacon apparatus that is provided corresponding to the gate apparatus and transmits

beacon information to a portable terminal; and

an authentication apparatus that associates registration information with one registered face image of a plurality of registered face images in response to reception of the beacon information by the portable terminal, the registration information indicating a user of the portable terminal, the authentication apparatus prioritizing, in authentication processing of authenticating the incoming person who comes into the gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation result between the face image information and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information.

Claim 11 The authentication system according to claim 10, wherein in a case where there are some or all of the plurality of registered face images associated with the registration information, the authentication apparatus extracts an authentication candidate from the some or all of the plurality of registered face images associated with the registration information

in response to a reception time of the beacon information at the portable terminal, the authentication candidate being subjected to the authentication processing.

Claim 12 The authentication system according to claim 10, wherein in a case where there are some or all of the plurality of registered face images associated with the registration information, the authentication apparatus extracts an authentication candidate from the some or all of the plurality of registered face images associated with the registration information in response to electric field intensities of the beacon information at the portable terminal, the authentication candidate being subjected to the authentication processing.

Claim 13 The authentication system according to claim 10, wherein a plurality of the beacon apparatuses is provided.

Claim 14 A program to be executed by a computer of a portable terminal to control the portable terminal, the portable terminal being used together with an authentication apparatus, the authentication apparatus performing actions comprising:

performing processing of associating registration information with one registered face image of a plurality of registered face images, the registration information indicating a user of the portable terminal; and

prioritizing, in authentication processing of authenticating an incoming person who comes into a gate apparatus based on a score which is a value indicating a possibility that the incoming person and a person corresponding to each of the plurality of registered face images are an identical person and corresponds to a collation result between face image information of the incoming person and each of the plurality of registered face images, a collation result between the registered face image associated with the registration information and the face image information of the incoming person over a collation result between a registered face

image not associated with the registration information and the face image information of the incoming person by performing predetermined addition processing on a score corresponding to the collation result between the registered face image associated with the registration information and the face image information of the incoming person, and

authenticates whether or not the incoming person is the identical person as the person corresponding to the registered face image used to obtain a collation result corresponding to a highest score, among a collation result prioritized by the registered face image being associated with the registration information and a collation result not prioritized by the registered face image not being associated with the registration information; and

the program causing, in a case where beacon information is received, the computer of the portable terminal to execute processing of controlling such that the beacon information and the registration information are transmitted.

Claim 15 The program according to claim 14, wherein:

the program causes the computer of the portable terminal to execute processing of storing a plurality of pieces of beacon information in a case where the plurality of pieces of beacon information are received within a predetermined time, and

the program causes the computer of the portable terminal to execute processing of controlling such that the plurality of pieces of beacon information are collectively transmitted together with the registration information when the predetermined time has elapsed.