management" or "tracking management." There is scope for further study on a method of realizing the passage management with a simple configuration.

[0005] One non-limiting and exemplary example of the present disclosure facilitates providing an information processing apparatus and an information processing method that realize, with a simple configuration, passage management of an object (for example, a person) passing through a gate.

[0006] An information processing apparatus according to one exemplary aspect of the present disclosure includes: an acquirer that acquires an image of a person entering a gate, the image being captured in a direction from an exit of the gate toward an entrance of the gate and including a face image region; a processor that performs a second face authentication process on the person who has been successful in a first face authentication process, the first face authentication process being based on a first face image region in a first image captured in a first area defined for the gate, the second face authentication process being based on a second face image region in a second image captured in a second area defined between the first area and the exit of the gate; and an output processor that produces an output to an effect that the person has passed through the gate, when it is determined by the second face authentication process that the person who has been successful in the first face authentication process and the person included in the second image are an identical person; wherein the processor determines that the person has entered the first area, when a rate of change in a size of the first face image region is equal to or greater than a first threshold, and determines that the person has entered the second area, when a rate of change in a size of the second face image region is equal to or greater than a second threshold greater than the first threshold.

[0007] An information processing method according to another exemplary aspect of the present disclosure includes steps performed by an information processing apparatus of: acquiring a captured image of a person who enters through an entrance of a gate; executing a first face authentication process based on image information on a first region of a face of the person in a first image, when the person enters the first area; executing a second face authentication process based on image information on a second region of the face of the person in a second image acquired after the first image, when the person is permitted in

the first face authentication process to pass through the gate and when the person enters a second area between the first area and an exit of the gate; producing an output to an effect that the person has passed through the gate, when it is determined by the second face authentication process that the person who has been successful in the first face authentication process and the person included in the second image are an identical person; determining that the person has entered the first area, when a rate of change in a size of the first face image region is equal to or greater than a first threshold, and determining that the person has entered the second area, when a rate of change in a size of the second face image region is equal to or greater than a second threshold greater than the first threshold.

[0008] It should be noted that a general or specific example may be implemented as a system, an apparatus, a method, an integrated circuit, a computer program, a storage medium, or any selective combination thereof.

[0009] One non-limiting and exemplary example of the present disclosure can realize, with a simple configuration, passage management of an object (e.g., a person) passing through a gate.

[0010] Additional benefits and advantages of the disclosed exemplary examples will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various examples and features of the specification and drawings, which need not all be provided in order to obtain one or more of such benefits and/or advantages.

Brief Description of Drawings

[0011]

FIG. 1 is a diagram illustrating an example of a gate according to an embodiment;

FIG. 2A is a diagram illustrating a conceptual configuration of a passage management system according to an embodiment;

FIG. 2B is a block diagram illustrating a configuration example of the passage management system according to an embodiment;

FIG. 3A is a diagram illustrating an example of zones defined for the gate;

FIG. 3B is a diagram illustrating an example of zones defined for the gate;

CLAIMS

Claim 1 An information processing apparatus, comprising:

an acquirer that acquires an image of a person entering a gate, the image being captured in a direction from an exit of the gate toward an entrance of the gate and including a face image region;

a processor that performs a second face authentication process on the person who has been successful in a first face authentication process, the first face authentication process being based on a first face image region in a first image captured in a first area defined for the gate, the second face authentication process being based on a second face image region in a second image captured in a second area defined between the first area and the exit of the gate; and

an output processor that produces an output to an effect that the person has passed through the gate, when it is determined by the second face authentication process that the person who has been successful in the first face authentication process and the person included in the second image are an identical person;

wherein

the processor

determines that the person has entered the first area, when a rate of change in a size of the first face image region is equal to or greater than a first threshold, and

determines that the person has entered the second area, when a rate of change in a size of the second face image region is equal to or greater than a second threshold greater than the first threshold.

Claim 2 The information processing apparatus according to claim 1, wherein

the processor

transmits image information on the first face image region to a server in the

first face authentication process, the server having information on a registrant permitted to pass through the gate,

receives, from the server, a collation result of collation between the image information on the first face image region and the information on the registrant,

determines based on the collation result whether or not the first face authentication process is successful,

receives information on a candidate corresponding to the registrant from the server when the collation between the image information on the first face image region and the information on the registrant is successful in the server, and

collates the information on the candidate and image information on the second face image region in the second face authentication process.

Claim 3 The information processing apparatus according to claim 1, wherein

the processor collates the image information on the first face image region with the image information on the second face image region in the second face authentication process.

Claim 4 The information processing apparatus according to claim 1, wherein

the processor performs the second face authentication process after the person has passed through the gate.

Claim 5 The information processing apparatus according to claim 1, wherein

the processor performs the second face authentication process using a feature amount smaller in number than a feature amount of a face used in the first face authentication process.

Claim 6 The information processing apparatus according to claim 1, wherein

the processor uses a threshold for face collation in the second face authentication

process, the threshold being smaller than a threshold compared with a collation score of face collation in the first face authentication process.

Claim 7 The information processing apparatus according to claim 1, wherein

the information processing apparatus outputs a sound or an image different between a case where the first face authentication process is successful and a case where the second face authentication process is successful.

Claim 8 An information processing method, comprising steps performed by an information processing apparatus of:

acquiring a captured image of a person who enters through an entrance of a gate;

executing a first face authentication process based on image information on a first region of a face of the person in a first image, when the person enters the first area;

executing a second face authentication process based on image information on a second region of the face of the person in a second image acquired after the first image, when the person is permitted in the first face authentication process to pass through the gate and when the person enters a second area between the first area and an exit of the gate;

producing an output to an effect that the person has passed through the gate, when it is determined by the second face authentication process that the person who has been successful in the first face authentication process and the person included in the second image are an identical person;

determining that the person has entered the first area, when a rate of change in a size of the first face image region is equal to or greater than a first threshold, and

determining that the person has entered the second area, when a rate of change in a size of the second face image region is equal to or greater than a second threshold greater than the first threshold.