information processing apparatus may be caused not only in the case where a target that is about to pass through the gate is a person but also in the case where collation is performed on any target.

[0008]

Therefore, embodiments of the present invention provide a collation system capable of solving the problems described above, that is, a problem of erroneous recognition of a target that is about to pass through the gate and a problem that a processing load is always placed on the information processing apparatus.

[0009]

According to a first aspect of the present invention, there is provided a collation system including: imaging means for acquiring a captured image of a pre-passage side area with respect to a gate; collation means for performing a collation process between a previously registered target and a target in the captured image; determination means for determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process; target information detection means for detecting target information representing a feature of the target in the captured image, wherein the collation means initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

In an embodiment, the collation means is configured to initiate the collation process on the basis of a condition, set to each area of the captured image, for the target located in the area.

[0010]

According to a second aspect of the present invention, there is provided an information processing apparatus including: collation means for performing a collation process between a target in a captured image of a pre-passage side area with respect to a gate and a previously registered target; determination means for determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process; and target information detection means for detecting target information representing a feature of the target in the captured image, wherein the collation means initiates the collation process on a basis of a condition, set to each

area of the captured image, for the target information of the target located in the area, and a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

In an embodiment, the collation means initiates the collation process on the basis of a condition, set to each area of the captured image, for the target located in the area.

[0011]

According to a third aspect of the present invention, there is provided a non-transitory computer-readable storage medium storing a program including instructions for causing an information processing apparatus to realize: collation means for performing a collation process between a target in a captured image of a pre-passage side area with respect to a gate and a previously registered target; determination means for determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process; and target information detection means for detecting target information representing a feature of the target in the captured image, wherein the collation means initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

In an embodiment, the collation means is configured to initiate the collation process on the basis of a condition, set to each area of the captured image, for the target located in the area.

[0012]

According to a fourth aspect of the present invention, there is provided a collation method including, by an information processing apparatus: performing a collation process between a target in a captured image of a pre-passage side area with respect to a gate and a previously registered target; and determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process, wherein the information processing apparatus detects a size or orientation of the target as target information representing a feature of the target in the captured image, and initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and

a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

In an embodiment, the information processing apparatus is configured to initiate the collation process on the basis of a condition, set to each area of the captured image, for the target located in the area.

[0013]

As per embodiments of the present invention, it is possible to suppress erroneous recognition of a target that is about to pass through the gate, and to suppress unnecessary collation processes to thereby reduce the processing load to be placed on the information processing apparatus.

BRIEF DESCRIPTION OF DRAWINGS

[0014]

Fig. 1 illustrates a used state of a face authentication system according to a first exemplary embodiment of the present invention.

Fig. 2 is a block diagram illustrating a configuration of the face authentication system according to the first exemplary embodiment of the present invention.

Fig. 3 illustrates an imaging state by the face authentication system disclosed in Fig. 1.

Fig. 4A illustrates a captured image captured in the imaging state of Fig. 3 by the face authentication system disclosed in Fig. 1.

Fig. 4B illustrates a captured image captured in the imaging state of Fig. 3 by the face authentication system disclosed in Fig. 1.

Fig. 5 illustrates an imaging state by the face authentication system disclosed in Fig. 1.

Fig. 6A illustrates a captured image captured in the imaging state of Fig. 5 by the face authentication system disclosed in Fig. 1.

Fig. 6B illustrates a captured image captured in the imaging state of Fig. 5 by the face

CLAIMS

1. A collation system comprising:

imaging means for acquiring a captured image of a pre-passage side area with respect to a gate;

collation means for performing a collation process between a previously registered target and a target in the captured image;

determination means for determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process;

target information detection means for detecting target information representing a feature of the target in the captured image, wherein

the collation means initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and

a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

2. The collation system according to claim 1, wherein

the collation means initiates the collation process for the target when the target information of the target in the captured image satisfies a condition set to an area of the captured image in which the target is located.

3. The collation system according to claim 2, wherein

the target information detection means detects the size of the target as the target information,

the collation means initiates the collation process for the target when the target information of the target in the captured image is larger than a value that is a condition set to each area of the captured image in which the target is located, and

a value that is a condition for the target information of the target, set to the end area relative to the center area in the horizontal direction of the captured image, is set to be larger than a value that is a condition for the target information of the target set to the center area.

4. The collation system according to claim 3, wherein

the target information detection means detects a distance between predetermined parts of a face of a person that is the target, as the target information representing the size of the target.

5. The collation system according to any of claims 1 to 4, wherein

the target information detection means detects an inter-eye distance of a person that is the target as the target information, and

the collation means initiates the collation process between the previously registered target and the target in the captured image when the inter-eye distance of the target located in a given area in the captured image satisfies a predetermined condition.

6. The collation system according to claim 5, wherein

the collation means initiates the collation process between the previously registered target and the target in the captured image when the inter-eye distance exceeds a value set to each area of the captured image,

a value set to the given area is smaller than a value set to an area other than the given area, and

the given area includes a pre-passage side area with respect to a first gate, and the area other than the given area includes a pre-passage side area with respect to a second gate adjacent to the first gate.

7. The collation system according to claim 1 or 2, wherein

the target information detection means detects an angle of a face of a person that is the target with respect to the imaging means as the target information representing the orientation of the target, on a basis of a position of a predetermined part of the face of the person,

the collation means initiates the collation process for the target when the angle that is the target information of the target in the captured image is equal to or smaller than a value that is a condition set to each area of the captured image in which the target is located, and

a value that is a condition for the target information of the target, set to the end area relative to the center area in the horizontal direction of the captured image, is set to be larger than a value of an angle that is a condition for the target information of the target set to the center area.

8. An information processing apparatus comprising:

collation means for performing a collation process between a target in a captured image of a pre-passage side area with respect to a gate and a previously registered target;

determination means for determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process; and

target information detection means for detecting target information representing a feature of the target in the captured image, wherein

the collation means initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and

a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

9. A non-transitory computer-readable storage medium storing a program comprising instructions for causing an information processing apparatus to realize:

collation means for performing a collation process between a target in a captured image of a pre-passage side area with respect to a gate and a previously registered target;

determination means for determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process; and

target information detection means for detecting target information representing a feature of the target in the captured image, wherein

the collation means initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and

a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.

10. A collation method comprising, by an information processing apparatus:

performing a collation process between a target in a captured image of a pre-passage side area with respect to a gate and a previously registered target; and

determining propriety of passage of the target with respect to the gate, on a basis of a result of the collation process, wherein

the information processing apparatus

detects a size or orientation of the target as target information representing a feature of the target in the captured image, and

initiates the collation process on a basis of a condition, set to each area of the captured image, for the target information of the target located in the area, and

a condition for the target information of the target, set to an end area relative to a center area in the horizontal direction of the captured image, and a condition for the target information of the target, set to the center area, are different from each other.