In the technique described in Patent Document 1, imaging with the above-mentioned two illuminations is performed for all target persons. Therefore, the technique described in Patent Document 1, there is a technical problem that the time required for iris recognition becomes relatively long.

This disclosure has been made in view of the above-mentioned problem. An object of this disclosure is to provide an iris recognition apparatus, an iris recognition method, a computer program, and a recording medium, that can reduce the time required for iris recognition.

An aspect of an iris recognition apparatus of this disclosure is provided with: an irradiating means for being capable of irradiating light to a target person to be recognized; an acquiring means for acquiring a first image which imaged a first imaging range including at least a face of the target person; and a determining means for determining an irradiation mode of light irradiated from the irradiating means to the target person when imaging a second image including an area, which includes an eye of the target person, and corresponding to a second imaging range, which is narrower than the first imaging range, based on the first image.

An aspect of an iris recognition method of this disclosure includes: acquiring a first image which imaged a first imaging range including at least a face of a target person to be recognized; and determining an irradiation mode of light irradiated to the target person when imaging a second image including an area, which includes an eye of the target person, and corresponding to a second imaging range, which is narrower than the first image range, based on the first image.

An aspect of a computer program of this disclosure causes a computer to execute the one aspect of the iris recognition method as described above.

An aspect of a recording medium of this disclosure is a recording medium

on which a computer program for causing a computer to execute an iris recognition method comprising: acquiring a first image which imaged a first imaging range including at least a face of a target person to be recognized; and determining an irradiation mode of light irradiated to the target person when imaging a second image including an area, which includes an eye of the target person, and corresponding to a second imaging range, which is narrower than the first image range, based on the first image is recorded.

According to one aspect of each of the iris recognition apparatus, iris recognition method, computer program and recording medium as described above, it is possible to reduce the time required for iris recognition.

Brief Description of Drawings

[FIG. 1] FIG. 1 is a block diagram showing an entire configuration of an iris recognition apparatus of an embodiment.

[FIG. 2] FIG. 2 is a block diagram showing a hardware configuration of an iris recognition unit of the embodiment.

[FIG. 3] FIG. 3 is a block diagram showing functional blocks implemented in a CPU provided in the iris recognition unit of the embodiment.

[FIG. 4] FIG. 4 is an image schematically showing a whole image.

[FIG. 5] FIG. 5 is a flowchart showing an operation of the iris recognition apparatus of the embodiment.

[FIG. 6] FIG. 6 is a flowchart showing a specific example of the operation of the iris recognition apparatus of the embodiment.

[FIG. 7] FIG. 7 is a block diagram showing functional blocks implemented in a CPU provided by an iris recognition unit of a modification of the embodiment.

[FIG. 8] FIG. 8 is a diagram showing a configuration of an iris recognition system of an application example.

Description of Embodiments

Embodiments of an iris recognition apparatus, an iris recognition method, a computer program and a recording medium will be described with reference to figures. In the following, embodiments of an iris recognition apparatus, an iris recognition

WHAT IS CLAIMED IS:

1. An iris recognition apparatus comprising:

an irradiating means for being capable of irradiating light to a target person to be recognized;

an acquiring means for acquiring that acquires a first image which imaged a first imaging range including at least a face of the target person; and

a determining means for determining that determines an irradiation mode of light irradiated from the irradiating means to the target person when imaging a second image including an area, which includes an eye of the target person, and corresponding to a second imaging range, which is narrower than the first imaging range, based on the first image.

2. The iris recognition apparatus according to claim 1, wherein the determining means determines the irradiation mode when imaging the second image based on the first image and an irradiation information of light irradiated to the target person when the first image is imaged.

3. The iris recognition apparatus according to claim 2, wherein the determining means determines the irradiation mode when imaging the second image based on a high-brightness area, which is included in an area including the eye of the target person of the first image and of which brightness is higher than a predetermined value, and the irradiation information.

4. The iris recognition apparatus according to claim 3, wherein the determining means determines the irradiation mode when imaging the second image by estimating a high-brightness area included in the area of the second image based on the high-brightness area included in the area in the first image, and the irradiation information.

5. The iris recognition apparatus according to claim 1, wherein the determining means determines an incident angle of light irradiated from the irradiating means to the target person as the irradiation mode when imaging the second image, based on the first image.

6. The iris recognition apparatus according to any one of claims 1 to 5, wherein

the irradiating means has a plurality of light sources having different incident angles of light emitted to the target person, and

the determining means selects a light source for realizing the determined irradiation mode from the plurality of light sources.

7. The iris recognition apparatus according to claim 6, wherein the determining means determines an incident angle of light irradiated from the irradiating means to the target person as the irradiation mode when imaging the second image, based on the first image.

8. The iris recognition apparatus according to claim 1, wherein the determining means determines a wavelength of light irradiated from the irradiating means to the target person as the irradiation mode when imaging the second image, based on the first image.

9. An iris recognition method comprising:

acquiring a first image which imaged a first imaging range including at least a face of a target person to be recognized; and

determining an irradiation mode of light irradiated to the target person when imaging a second image including an area, which includes an eye of the target person, and corresponding to a second imaging range, which is narrower than the first image

range, based on the first image.

10. A recording medium on which a computer program for causing a computer to execute an iris recognition method comprising: acquiring a first image which imaged a first imaging range including at least a face of a target person to be recognized; and determining an irradiation mode of light irradiated to the target person when imaging a second image including an area, which includes an eye of the target person, and corresponding to a second imaging range, which is narrower than the first image range, based on the first image is recorded.