

[Summary of Invention]

[Technical Problem]

[0006]

5 With regard to the photographing direction of the camera when mounting the wearable camera, a helmet-mounted or glasses-mounted wearable camera may eliminate adjusting the photographing direction of the camera in case of re-mounting the wearable camera after adjusting the photographing direction of the camera.

10 In contrast, the photographing direction of a badge-mounted wearable camera which is mounted on the chest, shoulder, or back may be changed from that in previous mounting due to variations in the body shapes of wearers, the deviations of mounting locations, or the like. Therefore, it is necessary to adjust the photographing direction of the camera while confirming an image captured by the camera with a monitor
15 after the camera has been mounted.

[0007]

 Therefore, to provide a technology for capable of setting the photographing direction of a camera to a predetermined direction when a terminal with the camera is mounted on a wearer.

20 [0008]

 Embodiments of the present invention provide a technology for solving the problems described above.

[Solution to Problem]

[0009]

25 A direction control device according to one aspect of the present disclosure includes: camera means for acquiring an image captured by photographing a subject by a camera targeted for adjustment of a photographing direction; image-processing means for calculating a position of a first setting image that represents the subject in the captured

image; posture detection means for detecting a difference between a position of a second setting image that represents the subject in a reference image registered in advance and the position of the first setting image; and camera control means for shifting the photographing direction of the camera based on the difference, wherein the image-processing means comprises:

image detection means for detecting a two-dimensional bar code from the captured image;

information extraction means for extracting information of the two-dimensional bar code; and

coordinate calculation means for calculating a position of the two-dimensional bar code in the captured image from the information extracted in the information extraction means, wherein the information of the two-dimensional bar code comprises installation height information of the two-dimensional bar code and size information of the two-dimensional bar code.

[0009a]

A wearable terminal according to another aspect of the present disclosure includes the above direction control device.

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[009b] A direction control device according to another aspect of the present disclosure comprises camera means for acquiring an image captured by photographing a subject by a camera targeted for adjustment of a photographing direction; image-processing means for calculating a position of a first setting image that represents the subject in the captured image; posture detection means for detecting a difference between a position of a second setting image that represents the subject in a reference image registered in advance and the position of the first setting image; and camera control means for shifting the photographing direction of the camera based on the difference, wherein the camera means comprises front camera means and back camera means; and wherein the camera control

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means controls a photographing direction of a camera in the back camera
means to be opposite to a photographing direction of a camera in the front
camera means when elevation angles of the photographing direction of the
camera in the front camera means and the photographing direction of the
5 camera in the back camera means are respectively symmetric with respect
to a horizontal.

[0010]

A direction control method according to another aspect of
10 the present disclosure includes: acquiring an image captured by
photographing a subject by a camera targeted for adjustment of a
photographing direction; calculating a position of a first setting image that
represents the subject in the captured image; detecting a difference
between a position of a second setting image that represents the subject in
15 a reference image registered in advance and the position of the first setting
image; and shifting the photographing direction of the camera based on the
difference, detecting a two-dimensional bar code from the captured image;
extracting information of the two-dimensional bar code; and
calculating a position of the two-dimensional bar code in the
20 captured image from the information extracted in the information
extraction means, wherein the information of the two-dimensional bar code
comprises installation height information of the two-dimensional bar code
and size information of the two-dimensional bar code.

[0011]

25 A recording medium according to another aspect of the
present disclosure storing a direction control program that causes a
computer to execute: acquiring an image captured by photographing a
subject by a camera targeted for adjustment of a photographing direction;
calculating a position of a first setting image that represents the subject in
30 the captured image; detecting a difference between a position of a second

setting image that represents the subject in a reference image registered in advance and the position of the first setting image; and shifting the photographing direction of the camera based on the difference, detecting a two-dimensional bar code from the captured image;

- 5 extracting information of the two-dimensional bar code; and
 calculating a position of the two-dimensional bar code in the captured image from the information extracted in the information extraction means, wherein the information of the two-dimensional bar code comprises installation height information of the two-dimensional bar code
10 and size information of the two-dimensional bar code.

[Advantageous Effects of Invention]

[0012]

- According to embodiments of the present invention, the photographing direction of a camera can be set to a predetermined
15 direction when a terminal with the camera is mounted on a wearer.

CLAIMS

[Claim 1]

A direction control device comprising:

- 5 camera means for acquiring an image captured by photographing a subject by a camera targeted for adjustment of a photographing direction;
image-processing means for calculating a position of a first setting image that represents the subject in the captured image;
posture detection means for detecting a difference between a
10 position of a second setting image that represents the subject in a reference image registered in advance and the position of the first setting image; and
camera control means for shifting the photographing direction of the camera based on the difference, wherein the image-processing means
15 comprises:
image detection means for detecting a two-dimensional bar code from the captured image;
information extraction means for extracting information of the two-dimensional bar code; and
20 coordinate calculation means for calculating a position of the two-dimensional bar code in the captured image from the information extracted in the information extraction means, wherein the information of the two-dimensional bar code comprises installation height information of the two-dimensional bar code and size information of the two-dimensional
25 bar code.

[Claim 2]

- The direction control device according to claim 1,
wherein the image-processing means comprises:
feature extraction means for extracting a feature amount from the
30 captured image;
a database in which the second setting image is stored;
feature verification means for verifying the second setting image stored in the database against the image feature extracted in the feature extraction means to specify the feature amount of the captured image;
35 and
coordinate calculation means for calculating the position of the verified second setting image.

[Claim 3] The direction control device according to claim 1,

- wherein the image-processing means comprises:
40 face detection means for detecting a face from the captured image;
a database in which a predetermined face image which is the second setting

image is stored;

face verification means for verifying the predetermined face image stored in the database against a face image detected in the face detection

5 means to specify a face image of the captured image; and

face coordinate calculation means for calculating a position of the verified face image.

[Claim 4]

10 The direction control device according to any one of claims 1 to claim 3,

wherein the camera means comprises a sensor that detects a posture of the camera;

15 the sensor stores a state of absence of a positional deviation in the photographing direction of the camera as a direction toward which the sensor is directed; and

the camera control means controls the photographing direction of the camera by using the direction toward which the sensor is directed.

[Claim 5]

The direction control device according to claim 4,
wherein the sensor is a triaxial gyro sensor or a 6-axis sensor.

5 [Claim 6]

A direction control device comprising:

camera means for acquiring an image captured by photographing a subject by a camera
targeted for adjustment of a photographing direction;

10 image-processing means for calculating a position of a first setting image that
represents the subject in the captured image;

posture detection means for detecting a difference between a position of a second
setting image that represents the subject in a reference image registered in advance and the
position of the first setting image; and

15 camera control means for shifting the photographing direction of the camera based on
the difference,

wherein the camera means comprises front camera means and back camera means; and

20 wherein the camera control means controls a photographing direction of a camera in the
back camera means to be opposite to a photographing direction of a camera in the front camera
means when elevation angles of the photographing direction of the camera in the front camera
means and the photographing direction of the camera in the back camera means are respectively
symmetric with respect to a horizontal.

[Claim 7]

A wearable terminal comprising:

25 the direction control device according to any one of claims 1 to 6.

[Claim 8]

A direction control method comprising:

acquiring an image captured by photographing a subject by a camera targeted for
adjustment of a photographing direction;

30 calculating a position of a first setting image that represents the subject in the captured
image;

detecting a difference between a position of a second setting image that represents the
subject in a reference image registered in advance and the position of the first setting image;

shifting the photographing direction of the camera based on the difference;

35 detecting a two-dimensional bar code from the captured image;

extracting information of the two-dimensional bar code; and

calculating a position of the two-dimensional bar code in the captured image from the
information extracted in the information extraction means, wherein the information of the
two-dimensional bar code comprises installation height information of the two-dimensional bar
code and size information of the two-dimensional bar code.

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[Claim 9]

A recording medium storing a direction control program that causes

a computer to execute:

acquiring an image captured by photographing a subject by a camera targeted for adjustment of a photographing direction;

5 calculating a position of a first setting image that represents the subject in the captured image;

detecting a difference between a position of a second setting image that represents the subject in a reference image registered in advance and the position of the first setting image; and

10 shifting the photographing direction of the camera based on the difference, detecting a two-dimensional bar code from the captured image;

extracting information of the two-dimensional bar code; and

15 calculating a position of the two-dimensional bar code in the captured image from the information extracted in the information extraction means, wherein the information of the two-dimensional bar code comprises installation height information of the two-dimensional bar code and size information of the two-dimensional bar code.