

Claims

1. A congestion state visualization device, comprising a processor that is configured to:
 - photograph a moving image of a prescribed area, and detect whether each person in the photographed moving image is in a moving state or in a standing-still state;
 - create a human-shaped icon indicating a person in the standing-still state;
 - detect a moving direction of a person in the moving state from the moving image and create a human-shaped icon indicating the person in the moving state and the moving direction thereof; and
 - create a congestion image which is obtained by superimposing the human-shaped icon on a previously-prepared background image in which the prescribed area is photographed, but the person is not photographed.
2. The congestion state visualization device according to claim 1,
 - wherein the processor: acquires a jammed-up time of the person in the standing-still state; and adds information indicating the jammed-up time to the human-shaped icon indicating the person in the standing-still state.
3. The congestion state visualization device according to claim 1 or 2,
 - wherein the processor creates respective human-shaped icons in different colors, in accordance with whether the person is in the standing-still state or in the moving state.
4. The congestion state visualization device according to claim 3,
 - wherein a combination of the different colors is a combination of colors which even those who have color vision deficiency can readily recognize.
5. The congestion state visualization device according to any one of claims 1 to 4,
 - wherein the processor creates a human-shaped icon indicating a prescribed direction, in accordance with the moving direction of the person in the moving state.
6. The congestion state visualization device according to claim 5,

wherein the processor creates a human-shaped icon indicating any one of at least four directions, in accordance with the moving direction of the person in the moving state.

7. The congestion state visualization device according to any one of claims 1 to 6, wherein the processor creates a human-shaped icon indicating the person in the moving state, at at least an upper part of the icon.

8. The congestion state visualization device according to any one of claims 1 to 7, wherein the processor:

extracts a motion trajectory of the person from a plurality of the moving images; and

detects a moving direction of the person based on the motion trajectory.

9. The congestion state visualization device according to any one of claims 1 to 8, wherein the processor:

extracts, from the moving image, the number of persons present in the moving image; and

outputs a congestion degree based on the number of the persons therein, the number of persons in standing-still state therein, and the number of persons in the moving state therein.

10. The congestion state visualization device according to claim 9, wherein the processor change a determination condition used when the congestion degree is determined, based on an external factor.

11. The congestion state visualization device according to any one of claims 1 to 10, wherein the processor outputs time information which is displayed together with the congestion image.

12. The congestion state visualization device according to any one of claims 1 to 11, wherein the background image is a previously-prepared image of an unmanned

ticket gate, and

wherein, if the human-shaped icon is overlapped with an image of a ticket gate in the unmanned ticket gate image, the processor creates a congestion image by superimposing the human-shaped icon on the unmanned ticket gate image with an overlapping portion removed therefrom.

13. A congestion state visualization system, comprising:

a photographing device that is configured to photograph a moving image of a prescribed area; and

a processing device that is configured to:

detect whether each person in the photographed moving image is in a moving state or in a standing-still state, from the moving image taken by the photographing device;

create a human-shaped icon indicating a person in the standing-still state;

detect a moving direction of a person in the moving state from the moving image and create a human-shaped icon indicating the person in the moving state and the moving direction thereof; and

create a congestion image which is obtained by superimposing the human-shaped icon on a previously-prepared background image in which the prescribed area is photographed, but the person is not photographed.

14. The congestion state visualization system according to claim 13,

wherein the processing device: acquires a jammed-up time of the person in the standing-still state; and adds information indicating the jammed-up time to a human-shaped icon indicating the person in the standing-still state.

15. The congestion state visualization system according to claim 13 or 14,

wherein the processing device creates respective human-shaped icons in different colors depending on whether the person is in the standing-still state or in the moving state.

16. The congestion state visualization system according to claim 15,

wherein a combination of the different colors is a combination of colors which even those who have color vision deficiency can readily recognize.

17. The congestion state visualization system according to claim 13,
wherein the processing device creates a human-shaped icon indicating a prescribed direction, in accordance with the moving direction of the person in the moving state.
18. The congestion state visualization system according to claim 14,
wherein the processing device creates a human-shaped icon indicating at least any one of four directions in accordance with the moving direction of the person in the moving state.
19. The congestion state visualization system according to any one of claims 13 to 15,
wherein the processing device creates a human-shaped icon indicating the person in the moving state, at least an upper part of which indicates the moving direction of the person.
20. A congestion state visualization method performed by a processor, comprising the steps of:
photographing a moving image of a prescribed area, and detecting whether each person in the photographed moving image is in a moving state or in a standing-still state;
creating a human-shaped icon indicating a person in the standing-still state;
detecting a moving direction of a person in the moving state from the moving image;
creating a human-shaped icon indicating the person in the moving state and the moving direction thereof; and
creating a congestion image which is obtained by superimposing the human-shaped icon on a previously-prepared background image in which the prescribed area is photographed, but the person is not photographed.
21. A congestion state visualization program to cause a computer to execute the steps of:
photographing a moving image of a prescribed area, and detecting whether each

person in the photographed moving image is in a moving state or in a standing-still state;
creating a human-shaped icon indicating a person in the standing-still state;
detecting a moving direction of a person in the moving state from the moving image;
creating a human-shaped icon indicating the person in the moving state and the moving direction thereof; and
creating a congestion image which is obtained by superimposing the human-shaped icon on a previously-prepared background image in which the prescribed area is photographed, but the person is not photographed.

22. A congestion state visualization device which analyzes an image data taken by a camera in a station in consideration of protection of personal information and places a human-shaped icon on an image of an unmanned ticket gate, the congestion state visualization device comprising a processor that is configured to:

photograph a ticket gate of interest and detect whether a person is in a moving state or in a standing-still state from a moving image contained in the photographed image data;

create a human-shaped in-motion icon indicating a person in the moving state or a human-shaped without-motion icon indicating a person in the standing-still state, in accordance with a state of the person;

the human-shaped in-motion icon and the human-shaped without-motion icon being in different colors,

the human-shaped in-motion icon being created so as to indicate a prescribed direction in accordance with a moving direction of the person in the moving-state, and the human-shaped in-motion icon also indicating the moving direction of the person in the moving-state at at least an upper part of the icon,

create a congestion image which is obtained by superimposing the human-shaped in-motion icon or the human-shaped without-motion icon on a previously-prepared image of the unmanned ticket gate as the ticket gate of interest; and

output the congestion image together with time information thereof.