

Claims

1. A video analysis device comprising:

a video data acquisition part configured to acquire video data from an external device, the video data having been acquired by the external device;

a moving object detection part configured to detect a moving object from video data by using a moving object detection parameter, the video data having been acquired by the video data acquisition part, the moving object detection parameter being a parameter for detecting a moving object;

an environment information collection part configured to collect environment information representing an external environment of a place where the external device having acquired the video data is installed; and

a parameter changing part configured to change the moving object detection parameter on a basis of the environment information collected by the environment information collection part, the moving object detection parameter being used when the moving object detection part detects the moving object.

2. The video analysis device according to Claim 1, wherein:

the moving object detection part is configured to detect the moving object by obtaining a difference of image data extracted from the video data and includes a sensitivity threshold as one of moving object detection parameters, the sensitivity threshold being a predetermined threshold to become a criterion for recognizing a disparity between image data of a previous frame and image data of a current frame; and

the parameter changing part is configured to change the sensitivity threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the sensitivity threshold being one of the moving object detection parameters.

3. The video analysis device according to Claim 1 or 2, wherein:

the moving object detection part is configured to use a predetermined filter when detecting the moving object from the video data and includes a moving object distinction threshold as one of moving object detection parameters, the predetermined filter being for removing a moving object other than a detection target object from a detection target, the detection target object being a target to be detected, the moving object distinction threshold being a predetermined threshold used when the predetermined filter distinguishes the detection target object from the moving object other than the detection target object; and

the parameter changing part changes the moving object distinction threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the moving object distinction threshold being one of the moving object detection parameters.

4. The video analysis device according to Claim 3, wherein:

the moving object detection part is configured to use a reciprocating object removal filter when detecting the moving object from the video data and includes a reciprocating object removal threshold as one of the moving object distinction parameters, the reciprocating object removal filter being configured to regard a reciprocating object as the moving object other than the detection target object and remove the reciprocating object from the detection target, the reciprocating object performing predetermined reciprocation, the predetermined reciprocation being a repetitive movement, the reciprocating object removal threshold being a threshold used when the reciprocating object removal filter distinguishes the detection target object from the reciprocating object; and

the parameter changing part changes the reciprocating object removal threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the reciprocating object removal threshold being one of the moving object detection parameters.

5. The video analysis device according to Claim 4, wherein:

the environment information collection part is configured to collect wind speed information as the environment information, the wind speed information representing a wind speed; and

the parameter changing part changes the reciprocating object removal threshold in accordance with the wind speed represented by the wind speed information collected by the environment information collection part, the reciprocating object removal threshold being one of the moving object detection parameters.

6. The video analysis device according to any of Claims 3 to 5, wherein:

the moving object detection part is configured to use a shadow removal filter when detecting the moving object from the video data and includes a shadow removal threshold as one of the moving object distinction parameters, the shadow removal filter being configured to regard a predetermined shadow as the moving object other than the detection target object and remove the predetermined shadow from the detection target, the shadow removal threshold being a threshold used when the shadow removal filter distinguishes the detection target object from the predetermined shadow; and

the parameter changing part changes the shadow removal threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the shadow removal threshold being one of the moving object detection parameters.

7. The video analysis device according to any of Claims 1 to 6, further comprising a parameter set storage part configured to store a predetermined set of the moving object detection parameters as a parameter set, the predetermined set of the moving object detection parameters being corresponding to a possible external environment,

wherein the parameter changing part changes the moving object detection parameters, on a basis of the environment information of the place where the external device having

acquired the video data is installed, by using the parameter set corresponding to the external environment represented by the environment information.

8. A video analysis method comprising:

collecting environment information and changing a moving object detection parameter on a basis of the collected environment information, the environment information representing an external environment of a place where an external device acquiring video data is installed, the moving object detection parameter being used when detecting a moving object from the video data; and

detecting the moving object from the video data by using the changed moving object detection parameter, the video data being acquired from the external device.

9. A computer-readable recording medium storing a program comprising instructions for causing a video analysis device to function as:

a video data acquisition part configured to acquire video data from an external device, the video data being acquired by the external device;

a moving object detection part configured to detect a moving object from video data by using a moving object detection parameter, the video data being acquired by the video data acquisition part, the moving object detection parameter being a parameter for detecting a moving object;

an environment information collection part configured to collect environment information representing an external environment of a place where the external device having acquired the video data is installed; and

a parameter changing part configured to change the moving object detection parameter on a basis of the environment information acquired by the environment information collection part, the moving object detection parameter being used when the moving object detection part detects the moving object.

10. A video analysis system comprising:

a video data acquiring means for acquiring video data;

a moving object detecting means for detecting a moving object from video data by using a moving object detection parameter, the video data having been acquired by the video data acquiring means, the moving object detection parameter being a parameter for detecting a moving object;

an environment information collecting means for collecting environment information representing an external environment of a place where the video data acquiring means is installed; and

a parameter changing means for changing the moving object detection parameter on a basis of the environment information collected by the environment information collecting means, the moving object detection parameter being used when the moving object detecting means detects the moving object.

CLAIMS

1. A video analysis system comprising:

a video data acquiring means for acquiring video data;

a moving object detecting means for detecting a moving object from video data by using a moving object detection parameter, the video data having been acquired by the video data acquiring means, the moving object detection parameter being a parameter for detecting a moving object;

an environment information collecting means for collecting environment information representing an external environment of a place where the video data acquiring means is installed; and

a parameter changing means for changing the moving object detection parameter on a basis of the environment information collected by the environment information collecting means, the moving object detection parameter being used when the moving object detecting means detects the moving object.

2. The video analysis system according to Claim 1, wherein:

the moving object detecting means is configured to detect the moving object by obtaining a difference of image data extracted from the video data and includes a sensitivity threshold as one of moving object detection parameters, the sensitivity threshold being a predetermined threshold to become a criterion for recognizing a disparity between image data of a previous frame and image data of a current frame; and

the parameter changing means changes the sensitivity threshold on a basis of the environment information collected by the environment information collecting means, the sensitivity threshold being one of the moving object detection parameters.

3. The video analysis system according to Claim 1 or 2, wherein:

the moving object detecting means is configured to use a predetermined filter when detecting the moving object from the video data and includes a moving object distinction threshold as one of moving object detection parameters, the predetermined filter being for removing a moving object other than a detection target object from a

detection target, the detection target object being a target to be detected, the moving object distinction threshold being a predetermined threshold used when the predetermined filter distinguishes the detection target object from the moving object other than the detection target object; and

the parameter changing means changes the moving object distinction threshold on a basis of the environment information collected by the environment information collecting means, the moving object distinction threshold being one of the moving object detection parameters.

4. The video analysis system according to Claim 3, wherein:

the moving object detecting means is configured to use a reciprocating object removal filter when detecting the moving object from the video data and includes a reciprocating object removal threshold as one of the moving object distinction parameters, the reciprocating object removal filter being configured to regard a reciprocating object as the moving object other than the detection target object and remove the reciprocating object from the detection target, the reciprocating object performing predetermined reciprocation, the predetermined reciprocation being a repetitive movement, the reciprocating object removal threshold being a threshold used when the reciprocating object removal filter distinguishes the detection target object from the reciprocating object; and

the parameter changing means changes the reciprocating object removal threshold on a basis of the environment information collected by the environment information collecting means, the reciprocating object removal threshold being one of the moving object detection parameters.

5. The video analysis system according to Claim 4, wherein:

the environment information collecting means is configured to collect wind speed information as the environment information, the wind speed information representing a wind speed; and

the parameter changing means changes the reciprocating object removal threshold in accordance with the wind speed represented by the wind speed information collected by the environment information collecting means, the

reciprocating object removal threshold being one of the moving object detection parameters.

6. The video analysis system according to any of Claims 3 to 5, wherein:

the moving object detecting means is configured to use a shadow removal filter when detecting the moving object from the video data and includes a shadow removal threshold as one of moving object distinction parameters, the shadow removal filter being configured to regard a predetermined shadow as the moving object other than the detection target object and remove the predetermined shadow from the detection target, the shadow removal threshold being a threshold used when the shadow removal filter distinguishes the detection target object from the predetermined shadow; and

the parameter changing means changes the shadow removal threshold on a basis of the environment information collected by the environment information collecting means, the shadow removal threshold being one of the moving object detection parameters.

7. The video analysis system according to Claim 6, wherein:

the environment information collecting means is configured to collect time information as the environment information, the time information representing time; and

the parameter changing means changes the shadow removal threshold in accordance with the time represented by the time information collected by the environment information collecting means, the shadow removal threshold being one of the moving object detection parameters.

8. The video analysis system according to any of Claims 1 to 7, further comprising a parameter set storing means for storing a predetermined set of the moving object detection parameters as a parameter set, the predetermined set of the moving object detection parameters being corresponding to a possible external environment,

wherein the parameter changing means changes the moving object detection parameters, on a basis of the environment information collected by the environment

information collecting means, by using the parameter set corresponding to the external environment represented by the environment information.

9. The video analysis system according to any of Claims 1 to 8, wherein the environment information is at least one of: luminance; time and date; meteorological information; and latitude and longitude.

10. A video analysis device comprising:

a video data acquisition part configured to acquire video data from an external device, the video data having been acquired by the external device;

a moving object detection part configured to detect a moving object from video data by using a moving object detection parameter, the video data having been acquired by the video data acquisition part, the moving object detection parameter being a parameter for detecting a moving object;

an environment information collection part configured to collect environment information representing an external environment of a place where the external device having acquired the video data is installed; and

a parameter changing part configured to change the moving object detection parameter on a basis of the environment information collected by the environment information collection part, the moving object detection parameter being used when the moving object detection part detects the moving object.

11. The video analysis device according to Claim 10, wherein:

the moving object detection part is configured to detect the moving object by obtaining a difference of image data extracted from the video data and includes a sensitivity threshold as one of moving object detection parameters, the sensitivity threshold being a predetermined threshold to become a criterion for recognizing a disparity between image data of a previous frame and image data of a current frame; and

the parameter changing part changes the sensitivity threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the sensitivity threshold being one of the moving object

detection parameters.

12. The video analysis device according to Claim 10 or 11, wherein:

the moving object detection part is configured to use a predetermined filter when detecting the moving object from the video data and includes a moving object distinction threshold as one of moving object detection parameters, the predetermined filter being for removing a moving object other than a detection target object from a detection target, the detection target object being a target to be detected, the moving object distinction threshold being a predetermined threshold used when the predetermined filter distinguishes the detection target object from the moving object other than the detection target object; and

the parameter changing part changes the moving object distinction threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the moving object distinction threshold being one of the moving object detection parameters.

13. The video analysis device according to Claim 12, wherein:

the moving object detection part is configured to use a reciprocating object removal filter when detecting the moving object from the video data and includes a reciprocating object removal threshold as one of the moving object distinction parameters, the reciprocating object removal filter being configured to regard a reciprocating object as the moving object other than the detection target object and remove the reciprocating object from the detection target, the reciprocating object performing predetermined reciprocation, the predetermined reciprocation being a repetitive movement, the reciprocating object removal threshold being a threshold used when the reciprocating object removal filter distinguishes the detection target object from the reciprocating object; and

the parameter changing part changes the reciprocating object removal threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the reciprocating object removal threshold being one of the moving object detection parameters.

14. The video analysis device according to Claim 12 or 13, wherein:

the moving object detection part is configured to use a shadow removal filter when detecting the moving object from the video data and includes a shadow removal threshold as one of the moving object distinction parameters, the shadow removal filter being configured to regard a predetermined shadow as the moving object other than the detection target object and remove the predetermined shadow from the detection target, the shadow removal threshold being a threshold used when the shadow removal filter distinguishes the detection target object from the predetermined shadow; and

the parameter changing part changes the shadow removal threshold on a basis of the environment information of the place where the external device having acquired the video data is installed, the shadow removal threshold being one of the moving object detection parameters.

15. The video analysis device according to any of Claims 10 to 14, comprising a parameter set storage part configured to store a predetermined set of the moving object detection parameters as a parameter set, the predetermined set of the moving object detection parameters being corresponding to a possible external environment,

wherein the parameter changing part changes the moving object detection parameters, on a basis of the environment information of the place where the external device having acquired the video data is installed, by using the parameter set corresponding to the external environment represented by the environment information.

16. The video analysis device according to any of Claims 10 to 15, wherein the environment information is at least one of: luminance; time and date; meteorological information; and latitude and longitude.

17. A video analysis method comprising:

collecting environment information and changing a moving object detection parameter on a basis of the collected environment information, the environment information representing an external environment of a place where an external device acquiring video data is installed, the moving object detection parameter being used

when detecting a moving object from the video data; and

detecting the moving object from the video data by using the changed moving object detection parameter, the video data being acquired from the external device.

18. The video analysis method according to Claim 17, comprising:

changing a sensitivity threshold on a basis of the environment information of the place where the external device acquiring the video data is installed, the sensitivity threshold being used as one of moving object detection parameters, the sensitivity threshold being a predetermined threshold to become a criterion for recognizing a disparity between image data of a previous frame and image data of a current frame; and

obtaining a difference of image data extracted from the video data by using the changed sensitivity threshold, and detecting the moving object.

19. The video analysis method according to Claim 18, comprising:

changing a moving object distinction threshold on a basis of the environment information of the place where the external device acquiring the video data is installed, the moving object distinction threshold being used as one of the moving object detection parameters, the moving object distinction threshold being a predetermined threshold used when distinguishing a detection target object from a moving object other than the detection target object, the detection target object being a target to be detected; and

by using the changed moving object distinction threshold, removing the moving object other than the detection target object from a detection target when detecting the moving object from the video data.

20. The video analysis method according to any of Claims 17 to 19, wherein the environment information is at least one of: luminance; time and date; meteorological information; and latitude and longitude.

21. A computer program comprising instructions for causing a video analysis device to function as:

a video data acquisition part configured to acquire video data from an external device, the video data being acquired by the external device;

a moving object detection part configured to detect a moving object from video data by using a moving object detection parameter, the video data being acquired by the video data acquisition part, the moving object detection parameter being a parameter for detecting a moving object;

an environment information collection part configured to collect environment information representing an external environment of a place where the external device having acquired the video data is installed; and

a parameter changing part configured to change the moving object detection parameter on a basis of the environment information acquired by the environment information collection part, the moving object detection parameter being used when the moving object detection part detects the moving object.