

CLAIMS

1.- A video surveillance system on board a rail vehicle, comprising a plurality of video surveillance cameras (4_1 , 4_i , 4_N) on board the rail vehicle (2), each camera (4_1 , 4_i , 4_N) having a spatial position and a related field of view, each camera being adapted to capture a video stream composed of a succession of digital images, the system (1) further comprising an on-board electronic calculation device (10), characterized in that:

- said ~~electronic~~ on-board electronic calculation device (10) comprises at least one calculation acceleration device (14),

and in that each camera (4_1 , 4_i , 4_N) is connected to the on-board electronic calculation device (10) and is adapted to transmit captured video streams to said on-board electronic calculation device (10),

the on-board electronic calculation device (10) being adapted for:

-obtaining a breakdown of the plurality of video surveillance cameras into a series of groups of cameras to be processed successively in time, according to a circular repetition, and for each group of cameras processed successively:

-a) obtaining (20) video streams from said group of cameras, each video stream containing at least one digital image,

-b) applying (22) digital image analysis to calculate values of characteristic descriptors of objects present in the or each image of each video stream from a camera of said group of cameras,

-c) applying (24) at least one situation analysis algorithm using the descriptor values calculated for at least one image of each video stream of said group of cameras processed to obtain a situation analysis result in the field of view of the cameras of said group of cameras.

2. The video surveillance system according to claim 1, wherein said digital image analysis implements, in each digital image of a video stream, a detection of persons and/or a skeleton extraction related to a person present in the vehicle.

3. The video surveillance system according to claim 2, wherein the values of characteristic descriptors comprise spatial positions, in a reference frame related to the digital image, of joints associated with a person present in the scene.

4. The video surveillance system according to any of claims 1 to 3, on board a rail vehicle comprising a plurality of carriages, each group of cameras being made up of cameras installed on board a carriage of the vehicle.

5. A system according to any one of claims 1 to 4, adapted for implementing several different situation analysis algorithms depending on the state of the rail vehicle.

6. The system according to any one of claims 1 to 5, wherein the situation analysis algorithm implements abnormal event detection, and in the event of a positive detection for a current camera group, the system is adapted for continuing to process video stream images from the current camera group.

7. The system according to any of claims 1 to 6, further adapted for raising a warning alert after the situation analysis application.

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8. The system according to any of claims 1 to 7, comprising a timing module (26) adapted for selecting a next video surveillance camera group to be processed, based on a the situation analysis result.

9. A video surveillance method implemented by a video surveillance system in accordance with any one of claims 1 to 8,

comprising steps consisting of:

-obtaining (50) a breakdown of the plurality of video surveillance cameras into a series of groups of cameras to be processed successively in time, according to a circular repetition, and for each group of cameras processed successively:

-a) obtaining (54) video streams from said group of cameras, each video stream containing at least one digital image,

-b) applying (56) digital image analysis to calculate values of characteristic descriptors of objects present in the or each image of each video stream from a camera of said group of cameras,

-c) applying (58) at least one situation analysis algorithm using the descriptor values calculated for at least one image of each video stream of said group of cameras processed to obtain a situation analysis result in the field of view of the cameras of said group of cameras.

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10. A method according to claim 9, further comprising a step of selecting the next camera group to be processed.

11. A computer program containing software instructions which, when executed
5 by a programmable electronic device, implement a video surveillance method according to claim 9.