

Claims

1. An image rendering method for matrix data I from an input signal having a high dynamic range, the method implemented by a computer, comprising the following steps consisting in:

- generating, from ~~the~~ initial matrix data, a first color image being a ~~called "low-intensity image", in which the~~ wherein one or more colors in said first color image represent low intensities of the input signal;
- generating, from the initial matrix data, a second color image being a ~~called "high-intensity image", in which the~~ wherein one or more colors in said second color image represent high intensities of the input signal, said generating step comprising at least one filtering step ~~consisting in~~ comprising applying, at each point (x, y) of the second color image, a non-linear low-pass filter of unimodal impulse response, centrally symmetrical with respect to ~~the~~ a point of coordinates (0,0);
- generating a merged color image combining, point-for-point, the low-intensity image and the high-intensity image in an average, weighted by a constant factor, of each of the one or more colors in said low-intensity image and said high-intensity image ~~the color components~~;
- normalizing the ~~combined~~ merged color image so that, at each point, ~~the~~ a luminance of ~~the~~ a resulting normalized image is equal to ~~the~~ a luminance of the low-intensity image; and
- redimensioning the resulting normalized image on at least one axis of ~~the~~ a matrix.

2. The method as claimed in claim 1, wherein the step of generating a low-intensity image comprises ~~steps consisting in~~ constructing a first temporary matrix equal to ~~the~~ an original image I from which is subtracted its minimum A , then ~~in~~ constructing a second temporary matrix equal to the first temporary matrix, except for ~~the~~ inputs with values higher than a predefined threshold T_1 ,

said inputs being set at T_1 , then ~~in~~ constructing a low-intensity color image from the second temporary matrix, by application of a first palette of colors.

3. The method as claimed in claim 2, wherein the step of generating a high-intensity image comprises the following steps consisting in:

- calculating a third temporary matrix, equal at all points to the first temporary matrix, except for ~~the~~ inputs with values lower than the predefined threshold T_1 , said inputs being set at zero, and except for ~~the~~ inputs with values higher than a threshold T_2 , said inputs being set at T_2 ;
- calculating ~~the a~~ maximum of ~~this the~~ third temporary matrix;
- applying, to the third temporary matrix, a non-linear low-pass filtering of unimodal impulse response, centrally symmetrical with respect to the point of coordinates (0,0);
- dividing, point-by-point, ~~the a~~ result of the non-linear low-pass filtering by ~~the an~~ overall maximum of this result, and multiplying by the maximum of the third temporary matrix; and
- constructing a high-intensity color image by application of a second palette of colors to ~~the a~~ result of ~~this division~~ the dividing step.

4. The method as claimed in ~~any one of~~ claims 1 ~~to 3~~, wherein the redimensioning of the resulting normalized image ~~consists in~~ comprises an upsampling or a downsampling on at least one of ~~the two~~ axes, by factors which are either predefined, or left to ~~the~~ control of an operator.

5. The method as claimed in ~~any one of~~ claims 1 ~~to 4~~, wherein the typical widths of the impulse response of the non-linear low-pass filter on ~~the two~~ horizontal and vertical axes of the matrix of the image depend on ~~the~~ spatial resolution of ~~the~~ input data along ~~these~~ said two axes.

6. The method as claimed in ~~any one of~~ claims 1 ~~to 5~~, wherein the typical widths of the impulse response of the non-linear low-pass filter on ~~the two~~

horizontal and vertical axes of the matrix of the image depend on ~~the~~ a rate of upsampling or downsampling of the image on the two axes.

7. The method as claimed in ~~any one of claims 1 to 6~~, wherein ~~the~~ a palette of colors used to generate the low-intensity image is of essentially constant hue and saturation and ~~the~~ coding of ~~the~~ data is performed by a variation of luminance, which increases with ~~the~~ intensity of the input signal.

8. The method as claimed in ~~any one of claims 1 to 7~~, wherein the input signal is preconditioned so that its average on a local horizon is constrained to a target value m , and ~~in which the~~ wherein a luminance of ~~the~~ a palette of colors used for the low-intensity image follows a log-sigmoid law.

9. The method as claimed in ~~any one of claims 1 to 8~~, wherein ~~the~~ a palette of colors used to generate the high-intensity image is, on the one hand, of essentially zero luminance for $I(x, y) \leq A + T_1$ and increases with $I(x, y)$, and, on the other hand, of variable hue and saturation, ~~the~~ a variation of hue and of saturation coding signal intensity information.

10. The method as claimed in ~~any one of claims 1 to 9~~, wherein the impulse response of the non-linear low-pass filter is a 2D Gaussian function whose standard deviation is ~~the~~ a "typical width" parameter.

11. The method as claimed in ~~any one of claims 1 to 10~~, further comprising a step of displaying or printing the redimensioned image.

12. An image rendering device for matrix data from an input signal having a high dynamic range, comprising means for implementing the steps of the method as claimed in ~~any one of claims 1 to 11~~.

13. A non-transitory processor-readable storage medium, on which is stored
a computer program—product, said computer program comprising code
instructions configured to implement~~allowing execution of~~ the steps of the
method as claimed in ~~any one of claims 1 to 11~~, when ~~said program is run on~~
5 ~~a~~executed by the computer.