

METHOD AND DEVICE FOR COMPRESSING DIGITAL IMAGES AND ASSOCIATED DECOMPRESSION METHOD AND DEVICE

The present invention relates to a method of compressing digital images and an
5 associated decompression method. It also relates to associated devices and computer
programs.

The invention lies in the field of the compression of still digital images or of
videos comprising successions of digital images, and finds a preferred application in the
field of very low bit rate compression.

10 In a known manner, the digital images are represented by samples called pixels,
ordered according to matrices and having associated digital values. Without compression,
each pixel is encoded on a number of bits, for example from 8 bits to 32 bits per pixel. The
number of bits required for such a representation of digital images is too large to be
compatible with hardware requirements for storage or transmission over digital image
15 communication networks.

Many digital image and video compression/decompression technologies have
been developed to decrease the number of bits (or bit rate) needed to represent images
and videos.

Some of the most well-known image and video compression standards include:
20 MPEG-2, ISO/IEC 13818-2 standard; H264 or MPEG-4 Part 10, Advanced Video Coding
(MPEG-4 AVC), ISO-14496 part 10 or ITU-T H.264 standard; H265 or MPEG-4 HEVC
(High Efficiency Video Coding), ISO/IEC 23008-2 standard. For the compression of still
images, the compression standards JPEG, ISO/IEC 10918 (1992) and JPEG 2000,
ISO/IEC 15444-1 standard are known in particular.

25 These compression technologies are designed to maximize the quality of the
images for a target bit rate, and/or to minimize the bit rate given a target quality.

The quality is measured by a criterion of resemblance between the initial digital
image and the digital image obtained after compression and decompression. For
example, a conventionally used criterion is the PSNR (peak signal to noise ratio)
30 measurement. At very low bit rates, for example for a bit rate lower than 100 kbit/s for a
stream of 640x480 definition images at 25 images per second, the classic quality
optimization criterion, based on computational quality measurements such as the PSNR,
results in images that are difficult to interpret by a human observer.

For some applications the bandwidth of the communication channels available for the transmission of images or videos is very low, but it is critical to obtain understandable and usable images.

5 The object of the invention is to remedy the drawbacks of the prior art by proposing a compression method, and an associated decompression method, as well as associated devices, making it possible to obtain images or videos which remain interpretable by a computer human operator, while being compressed at very low speed.

10 To this end, the invention provides a method of compressing digital images, an initial digital image to be compressed being defined by at least one matrix of pixels having associated digital values, the method being implemented by a programmable compression device comprising at least one processor and one electronic memory. The method comprises steps, implemented by said processor, of:

- 15 - application of semantic segmentation to the initial digital image, making it possible to obtain a segmented image in which each pixel is associated with a semantic class from among a set of predetermined semantic classes previously stored,
- obtaining an image to be encoded from said segmented image,
- compression of the image to be encoded and obtaining a binary stream.

20 Advantageously, the invention proposes the application of semantic segmentation followed by compression of an image to be encoded obtained from the segmented image. Advantageously, the semantic classes associated with the pixels of the segmented image are coded, which facilitates understanding by an operator.

25 The image compression method according to the invention may also have one or more of the characteristics below, taken independently or in any technically feasible combination.

The application of semantic segmentation includes the application of a deep learning algorithm based on neural networks.

30 The method further comprises a complementary segmentation applied to the initial digital image, and a merger between the image segmented by the application of semantic segmentation and the image segmented by said complementary segmentation, the result of the merger being used for obtaining an image to be encoded.

Complementary segmentation is contour-based segmentation.

35 Obtaining an image to be encoded involves assigning the same numerical encoding value to all the pixels of the segmented image belonging to the same semantic class.

For at least one subset of pixels belonging to the same semantic class, the initial digital value of the spatially corresponding pixels of the initial digital image is copied from the initial digital image into the image to be encoded.

According to another aspect, the invention relates to a method for decompressing digital images compressed by a compression process as briefly described above, implemented by a programmable decompression device comprising at least a processor and an electronic memory. The method comprises steps implemented by said processor, of receiving a binary train and decompressing said binary train to obtain a decoded digital image, comprising at least one set of pixels of the same value associated with a semantic class among a set of predetermined semantic classes previously memorized.

The method for decompressing images according to the invention may also have one or more of the characteristics below, taken independently or in any technically feasible combination.

It comprises a mapping between pixel values of the decoded digital image and semantic classes, and an informative display of semantic classes associated with the decoded digital image.

The decompression method further comprises a step of rendering a textured decoded image, in which, for at least one subset of pixels associated with a semantic class, wherein an assignment of new digital values to the pixels of said subset is performed by function of said semantic class.

The textured decoded image rendering step implements an image generation algorithm based on neural networks.

According to another aspect, the invention relates to a device for compressing digital images, an initial digital image to be compressed being defined by at least one matrix of pixels having associated digital values, the compression device being a programmable device comprising at least a processor and an electronic memory. The processor of the compression device is designed to implement:

- a semantic segmentation module designed to apply semantic segmentation to the initial digital image, making it possible to obtain a segmented image in which each pixel is associated with a semantic class from among a set of predetermined semantic classes previously stored,
- a module for obtaining an image to be encoded from said segmented image,
- a module for compressing the image to be encoded and obtaining a binary stream.

The digital image compression device according to the invention is designed to implement a digital image compression method as briefly described above.

According to another aspect, the invention relates to a device for decompressing digital images of digital images compressed by a device for compressing digital images as briefly described above, said decompression device being a programmable device comprising at least a processor and an electronic memory. The processor of the decompression device is designed to implement a module for receiving a binary train and a decompression module designed to apply an algorithm for decompressing said binary train to obtain a decoded digital image, comprising at least one set of pixels of the same value associated with a semantic class from among a set of predetermined semantic classes previously stored.

The digital image decompression device according to the invention is designed to implement a decompression method as briefly described above.

According to another aspect, the invention relates to an information recording medium, on which are stored software instructions for the execution of a digital image compression method as briefly described above, when these instructions are performed by a programmable electronic device.

According to another aspect, the invention relates to a computer program comprising software instructions which, when they are implemented by a programmable electronic device, implement a method for compressing digital images as briefly described above.

According to another aspect, the invention relates to an information recording medium, on which are stored software instructions for the execution of a digital image decompression method as briefly described above, when these instructions are performed by a programmable electronic device.

According to another aspect, the invention relates to a computer program comprising software instructions which, when they are implemented by a programmable electronic device, implement a method for decompressing digital images as briefly described above.

Other characteristics and advantages of the invention will emerge from the description given below, by way of indication and in no way limiting, with reference to the appended figures, among which:

- [Fig 1] Figure 1 is a block diagram of a system implementing compression and decompression devices according to the invention;

- [Fig 2] Figure shows 2 schematically an initial digital image to be compressed;
- [Fig 3] Figure 3 shows schematically an image segmented by semantic segmentation of the digital image of Figure 2;
- 5 - [Fig 4] Figure 4 is a block diagram of the main steps of a compression method according to a first embodiment of the invention;
- [Fig 5] Figure 5 is a block diagram of the main steps of a compression method according to a second embodiment of the invention;
- 10 - [Fig 6] Figure 6 is a block diagram of the main steps of a decompression method according to one embodiment of the invention.

FIG. 1 is a block diagram of a system 2 for compressing/decompressing digital images or videos according to the invention.

15 The system 2 comprises a compression device 4, and a decompression device 6, which are programmable electronic devices, for example computers.

In one embodiment, the compression 4 and decompression 6 devices are remote, and are adapted to communicate via a telecommunications network 8, which is for example a radio telecommunications network. Each of the devices 4, 6 comprises a transmission/reception module 10, 12, suitable for communicating data formatted
20 according to a predetermined communication protocol, suitable for communication via the telecommunications network 8.

The compression device 4 also comprises an electronic memory 14, suitable for storing data in the form of files or registers for example, and a calculation unit 16, which is for example a processor, suitable for carrying out calculations and computer program
25 instructions when the device 4 is powered on. The elements 10, 14, 16 of the compression device are designed to communicate via communication buses 15.

An initial digital image 20, which is to be compressed, is supplied to the input of the compression device 4. The initial digital image 20 is either a still image, for example from a photographic sensor, or an image extracted from a video.

30 The initial digital image 20, referred to simply as the initial image hereinafter, is, in one embodiment, provided on a computer readable data recording medium.

In a known manner, the initial image 20 is composed of one or more matrices of pixels, and each pixel has an associated value, which is encoded on a predetermined number of bits, for example 8 or 32 bits.

The processor 16 of the compression device 4 implements a semantic segmentation module 22 making it possible to obtain a segmented image from the initial image, a module 24 for obtaining an image to be encoded from the segmented image and a compression module 26 which implements a chosen compression algorithm. These modules will be described in more detail below. The modules 22, 24, 26 implement a compression method according to the invention.

Embodiments of the compression method will be described in detail below.

The semantic segmentation 22, obtaining an image to be encoded 24 and compression 26 modules are, for example, implemented by software, in the form of executable program code instructions.

As a variant, these modules are each made in the form of a programmable logic component, such as an FPGA (Field Programmable Gate Array), a GPU (graphics processing unit) or a GPGPU (general purpose graphics processing unit), or in the form of a dedicated integrated circuit, such as an ASIC (Application Specific Integrated Circuit).

The semantic segmentation module 22 performs a segmentation of the initial image into semantic classes from among a plurality of classes 18 previously stored. In addition, an association between semantic classes and digital coding values assigned to the pixels, for example in the form of a table 28, is also stored in the electronic memory 14 of the compression device 4.

The module for obtaining an image to be encoded 24 implements pre-processing, of the segmented image, and optionally of the initial image, to obtain an image to be encoded. Several embodiments of this module will be described below.

The compression module 26 preferably applies a known compression standard, for example one of the MPEG-4 AVC, MPEG-4 HEVC standards. Alternatively, the compression module 26 applies a proprietary compression method.

At the end of the application of the compression method, a binary train 30 is obtained, for example stored in a file representative of the initial image in a compressed format associated with the chosen compression method.

In the illustrated embodiment, the file containing the compressed representation of the initial image (bit stream 30) is transmitted, via the telecommunications network 8, to the decompression device 6.

The decompression device 6 also comprises an electronic memory 32, suitable for storing data in the form of files or registers for example, and a calculation unit 34, which is a processor, capable of carrying out calculations and computer program code

instructions when device 6 is powered on. The elements 12, 32, 34 of the decompression device are designed to communicate via communication buses 35.

The binary train 30 representative of the initial image in compressed format is supplied to the input of the decompression device 6.

5 The processor 34 of the decompression device 6 implements a decompression module 36, programmed to implement the decompression algorithm corresponding to the compression algorithm applied by the module 26 of the compression device 4. The processor 34 also implements a module 38 for associating semantic classes with the image obtained by the decompression module 36, and optionally a module 40 for
10 rendering a textured decoded image, the image rendering comprising the addition of textures on at least part of the image obtained by module 38.

The decompression 36, semantic class association 38 and image rendering 40 modules are for example implemented by software, in the form of executable program code instructions.

15 As a variant, these modules are each made in the form of a programmable logic component, such as an FPGA (Field Programmable Gate Array), a GPU (graphics processor) or a GPGPU (general Purpose Graphics Processing Unit), or in the form of a dedicated integrated circuit, such as an ASIC (Application Specific Integrated Circuit).

The semantic class association module 38, and, optionally, the image rendering
20 module 40 use semantic classes from among a plurality of classes 18 previously stored, as well as an association between semantic classes and digital encoding values assigned to the pixels, for example in the form of a table 28.

The set of semantic classes 18 and the table 28 are for example stored in the electronic memory 32 of the decompression device 6.

25 The set of semantic classes 18 and the table 28 are shared with the compression device 4, for example they are recorded in a prior installation phase, or transmitted from the compression device 4 to the decompression device 6.

At the end of the implementation of the decompression method, a decoded digital image 50 is obtained. The decoded digital image 50 advantageously comprises
30 semantic information from the initial image 20.

FIG. 2 schematically illustrates an initial image 20 to be compressed, which in this example is a road view, showing a vehicle 21, trees 23, 25, 27, a road 29, a building 31. In a natural image, the elements "vehicle", "trees", "road" have a specific representation linked in particular to the color and make of the vehicle, to the species of

trees and to the season. Their shape in the image depends on the angle of view, the distance from the sensor etc.

Thanks to the application of semantic segmentation, and as illustrated schematically in Figure 3, it is possible to classify the elements of the initial image into semantic classes, automatically and without the intervention of a human operator. Thus, in the segmented image 20' obtained by applying a semantic segmentation to the initial image 20, the pixels of the image are associated with predetermined semantic classes, for example: C1 for trees, C2 for buildings, C3 for vehicles, C4 for roads, C5 for sidewalks.

In the simplified example illustrated, each pixel of the segmented image is associated with a semantic class or label.

In one embodiment, the image to be encoded is formed by associating a same digital value, called a digital encoding value, with all the pixels of the same semantic class.

For example, the pixels of the class C1 have a value of $V1 = 10$, the pixels of the class C2 have a value of $V2 = 20$, the pixels of the class C3 have a value of $V3 = 30$, the pixels of the class C4 have a value of $V4 = 40$, the pixels of the class C5 have a value $V5 = 50$. To facilitate interpretation, hatched areas corresponding to classes are shown.

Advantageously, the bit rate necessary for encoding such an image to be encoded is generally low.

In one embodiment, in addition, the segmented image is enhanced by preprocessing, with additional information obtained from the initial image.

According to one variant, in the image to be encoded obtained from the segmented image, at least for a subset of pixels associated with the same semantic class, the initial values of the spatially corresponding pixels of the initial image are preserved.

For example, the values of the pixels of class C3 "vehicle" are preserved, and the pixels of the other semantic classes of the image take predetermined numerical encoding values according to the associated semantic class, as explained above. Advantageously, the information of the initial image is stored and transmitted to the decompression device for the semantic class(es) chosen.

A first embodiment of the compression method according to the invention is described below with reference to Figure 4.

An initial image 20, which is the image to be compressed, is provided at the input of the method.

During a semantic segmentation step 60, a semantic segmentation algorithm is applied, making it possible to assign each pixel of the image to a semantic class from

among a set of predetermined semantic classes 18, which is known and memorized beforehand.

For example, the semantic segmentation algorithm is a deep learning algorithm based on neural networks, using a learning database comprising images whose semantic classes have been previously annotated and memorized. For example, a Mask R-CNN type neural network as described in the article “Mask R-CNN” by Kaiming He et al, published in ICCV 2017, which is a particular implementation of a convolutional neural network, is used for semantic segmentation.

In step 62 of obtaining an image to be encoded, a numerical encoding value is assigned to each pixel according to the semantic class into which it has been classified.

In one embodiment, steps 60 and 62 are combined into a single step.

As a variant, in step 62 the digital encoding values, which are associated with the semantic classes, are chosen based on the initial image or on semantic criteria. For example, digital encoding values are assigned based on the number of pixels per class. For example, for the class associated with the largest number of pixels, the value 0 is the assigned numerical encoding value.

As a variant, the assigned numerical encoding value is associated with the semantic class, to correspond to a chosen color, for example encoding vegetation in green, buildings in gray, vehicles in red etc.

In step 62, an association is applied between semantic classes and digital coding values, which is for example stored in the form of a table 28.

At the end of step 62, a digital image to be encoded is obtained.

This image to be encoded is compressed in the compression step 64, by applying a chosen compression algorithm, for example according to one of the MPEG-4 AVC, MPEG-4 HEVC standards.

The parameters of the compression algorithm are for example chosen according to a target bit rate.

Optionally, a step 66 of transmitting to the decompression device the table 28 of association between the semantic classes and digital encoding values assigned to the pixels is implemented. In one embodiment, the table 28 is encoded and transmitted in metadata encoded in the header of the bit stream 30.

The bit stream 30 comprising image data compressed according to the chosen format is obtained and stored, for example in a compressed data file, and/or transmitted to a decompression device.

A second embodiment of the compression method according to the invention is described below with reference to Figure 5.

An initial image 20, which is the image to be compressed, is provided at the input of the method.

5 A semantic segmentation step 60, analogous to the semantic segmentation step described with reference to Figure 4, is implemented.

10 In addition, in parallel or not with the semantic segmentation, an extraction of gradients (step 68) is applied to the initial image 20, by any method of extraction of gradients known in the field of digital image processing. The gradients are, in a known manner, representative of the high spatial frequencies in the initial image 20.

15 Gradient extraction provides an image of gradients. In one embodiment, the image of gradients is binarized based on a predetermined threshold value, so as to maintain the main gradients. These main gradients provide information relating to contours present in the image, which is additional information to improve the interpretation of an observed image.

20 Moreover, in parallel or not with the semantic segmentation 60, segmentation based on contours is carried out at the complementary segmentation step 70. This segmentation based on contours is for example carried out by a superpixel type algorithm, such as for example the SLIC algorithm. for "Simple Linear Iterative Clustering". A superpixel is a collection of adjacent pixels.

As a variant, any other known contour-based segmentation algorithm may be used in the complementary segmentation step 70.

At the end of the complementary segmentation step 70, an additional segmented image is obtained.

25 Steps 60, 68, and 70 are followed by a merging step 72, resulting in an improved segmented image.

In the merging step 72, the segmented image from the semantic segmentation is combined with the additional segmented image from the contour-based segmentation.

30 During this combination, when edge-based segmentation is performed by the SLIC algorithm, for each superpixel, it is determined which is the major semantic class, i.e. the semantic class mostly associated with the pixels of the superpixel. The major semantic class is then assigned to each pixel of the superpixel in the enhanced segmented image.

35 Additionally, in the merging step 72, the major gradients obtained in step 68 are added into the enhanced segmented image. For example, a predetermined value is

assigned to each pixel in the enhanced segmented image corresponding to a gradient value in the binarized image of the gradients. For example, the predetermined value is equal to 255 when the pixel values are coded on 8 bits.

Alternatively, only one of the steps 68 or 70 is implemented, and the merging step 72 is adapted accordingly.

Then, a step 74 of generating the image to be encoded is implemented.

Analogously to step 62 described with reference to FIG. 4, a numerical coding value is assigned to each pixel according to the semantic class into which it has been classified.

If the gradient extraction step 68 has been implemented, pixels having a predetermined gradient value are preserved in the image to be encoded. Thus, the image to be encoded contains additional information.

In addition, optionally, in at least part of the segmented image, for example for the pixels of the same semantic class, the initial value of the spatially corresponding pixels of the initial image is copied from the initial image into the image to be encoded.

Thus, the image to be encoded obtained is enriched with data from the initial image (or "real image"), while containing uniform areas corresponding to semantic classes. This image to be encoded in this embodiment is called an enriched image to be encoded.

The enriched image to be encoded is then compressed during a compression step 64, already described above with reference to FIG. 4.

A binary train 30 comprising data compressed according to the chosen format is obtained and stored and/or transmitted to a decompression device.

An embodiment of the decompression method according to the invention is described below with reference to Figure 6.

A file comprising a bit stream 30 of compressed image data is input.

A first decompression step 80 is applied, implementing a decompression algorithm corresponding to the compression algorithm applied in compression step 64.

At the end of step 80, a decoded digital image is obtained, which is viewable and contains sets of pixels of the same value analogous to the sets of pixels of the image to be encoded.

Optionally, a step 82 of extracting an association table 28 between semantic classes and digital coding values assigned to the pixels is implemented. Table 28 is for example extracted from the metadata of the binary train 30 received, or from a memory of the decompression device.

A step 84 of mapping between values of the pixels and semantic classes is implemented. For example, an informative display of the semantic classes, for example in the form of a legend, accompanies this mapping.

Then, a textured decoded image rendering step 86 is implemented, for at least one set of pixels of the decoded digital image of the same value corresponding to the same semantic class.

For at least one set of pixels associated with a semantic class, new values are assigned to the pixels of this set as a function of the associated semantic class.

For example, an image generation algorithm based on neural networks, for example of the "Generative Adversarial Network" type, is implemented. Step 86 uses data previously obtained during a learning phase.

For example, for a "tree" class, a tree texture will be generated. This texture corresponds to the semantic class, but depends on the data used during the prior learning applied in the neural network. There is no faithful reproduction of the type of texture actually present in the initial image, for example the initial tree is an oak, but the image obtained by the neural network in step 86 is an image of a chestnut tree. However, the interpretation of the image obtained by a human operator is greatly facilitated.

It should be noted that if the image decoded in step 80 also comprises one or more areas containing decoded pixel values corresponding to the initial image, or, in other words, if an enriched image to be encoded has been compressed, these areas are preserved.

The image obtained from step 86 is a textured decoded image, which is enriched for interpretation by a human operator.

During an optional additional improvement step 88, when the processed image is part of a video stream, the enriched decoded image obtained in step 86 is improved by replacing the pixels of certain semantic classes with values of pixels copied from an image previously received and decoded, and comprising decoded values of the real texture of the initial image for a given semantic class.

The step 88 of further improvement is followed by a step 90 of displaying the enriched decoded image, comprising textures corresponding to the semantic classes or to the values of the pixels of the initial image.

It should also be noted that if this is of interest for an application, it is possible to modify certain semantic classes, for example replacing "tree" by "building", or to anonymize certain objects in the image. The modification may be carried out for example by the compression device during step 62 for generating an image to be encoded, or by

the decompression device during step 84 of matching between values of the pixels and semantic classes. Of course, implementation variants are possible.

Advantageously, the compression method of the invention makes it possible to obtain data compressed at a very low rate, which then makes it possible to obtain, by the decompression method, images which may be used and understood by a human operator, thanks to the semantic segmentation .

CLAIMS

1. Method for compressing digital images, an initial digital image to be compressed being defined by at least one matrix of pixels having associated digital values, the method
5 being implemented by a programmable compression device (4) comprising at least one processor (16) and an electronic memory (14), characterized in that it comprises the steps, implemented by said processor (16), of:

- applying a semantic segmentation (60) to the initial digital image (20), making it possible to obtain a segmented image in which each pixel is associated with a semantic
10 class among a set of predetermined semantic classes (18) previously stored,

- obtaining (62, 68-72) of an image to be encoded from said segmented image, comprising the assignment of the same digital encoding value to all the pixels of the segmented image belonging to the same semantic class,

- compressing (64) the image to be encoded and obtaining a binary stream (30)
15 further comprising memorizing in a table an association between the semantic classes and digital encoding values and a transmission of said table to a decompression device.

2. The compression method according to claim 1, wherein the application (60) of semantic segmentation comprises the application of a deep learning algorithm based on
20 neural networks.

3. Compression method according to one of claims 1 or 2, further comprising a complementary segmentation (70) applied to the initial digital image (20), and a merger (72) between the image segmented by the application of semantic segmentation and the image
25 segmented by said complementary segmentation, the result of the merger being used for obtaining an image to be encoded.

4. Compression method according to claim 3, wherein said complementary segmentation (70) is contour-based segmentation.
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5. Compression method according to claim 1, in which, for at least one subset of pixels belonging to the same semantic class, the initial digital value of the spatially corresponding pixels of the initial digital image is copied from the initial digital image in the
35 image to be encoded.

6. Method for decompression of digital images compressed by a compression method according to claims 1 to 5, implemented by a programmable decompression device (6) comprising at least one processor (34) and an electronic memory (32), characterized in that it comprises steps implemented by said processor (34), of receiving a binary train and decompression (80) of said binary train to obtain a decoded digital image, comprising at least one set of pixels of the same value associated with a semantic class from among a set of predetermined semantic classes previously stored, and receiving a table comprising an association between the semantic classes and digital encoding values.

7. Decompression method according to claim 6, further comprising a step of rendering (86) a textured decoded image, in which, for at least one subset of pixels associated with a semantic class, a attribution of new digital values to the pixels of said subset is carried out as a function of said semantic class.

8. Decompression method according to claim 7, wherein the textured decoded image rendering step (86) implements an image generation algorithm based on neural networks.

9. Computer program comprising software instructions which, when implemented by a programmable electronic device, implement a digital image compression method according to claims 1 to 5.

10. Computer program comprising software instructions which, when implemented by a programmable electronic device, implement a digital image decompression method according to claims 6 to 8.

11. Device for compressing digital images, an initial digital image to be compressed being defined by at least one matrix of pixels having associated digital values, the compression device (4) being a programmable device comprising at least one processor (16). and an electronic memory (14), characterized in that said processor (16) is designed to implement:

- a semantic segmentation module (22) designed to apply semantic segmentation to the initial digital image (20), making it possible to obtain a segmented image in which

each pixel is associated with a semantic class from among a set of predetermined semantic classes (18) previously memorized,

- a module (24) for obtaining an image to be encoded from said segmented image, configured to assign the same digital encoding value to all the pixels of the segmented
5 image belonging to the same semantic class,

- a module for compressing (26) the image to be encoded and obtaining a binary stream (30), the device for compressing digital images being further configured to memorize in a table an association between the semantic classes and digital encoding values and a transmit said table to a decompression device.

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12. Device for decompression of digital images compressed by a digital image compression device according to claim 11, said decompression device (6) being a programmable device comprising at least one processor (34) and an electronic memory (32). , said processor being characterized in that it is designed to implement a module for
15 receiving a binary train and a decompression module (36) designed to apply an algorithm for decompressing said binary train so as to obtain a decoded digital image, comprising at least one set of pixels of the same value associated with a semantic class from among a set of predetermined semantic classes previously stored, the device for decompression of digital images being further configured to receive a table comprising an association between
20 the semantic classes and digital encoding values.