on the motion of every portion/element of the signal, e.g. highly quantized motion information suitable to distinguish between what moves with a motion within a given range of movements vs. what is still or moves with a movement outside of the range), class maps (which provide, for every portion/element of the signal, information relative to what class it belongs to, e.g., distinguishing in medical imaging between plane elements belonging to bones, soft tissues, fluids, metals, etc.), and so forth.

One of the key characteristics of auxiliary maps is that they present fairly homogenous areas separated by sharp discontinuities, and it is often inappropriate to modify their resolution (e.g., obtaining a more accurate map starting from a lower resolution one, or vice versa) by leveraging interpolation techniques or other standard upsampling/downsampling techniques. For instance, in a video it would be inappropriate to define the motion of an element at the transition between two objects moving in different ways by means of a motion vector calculated by interpolating the two different motions, since the interpolation would likely lead to a movement that has nothing to do with either of the two movements. In a similar fashion, in a medical image it would be inappropriate to define the value of an element at the transition between a bone and a soft tissue by means of interpolating the two corresponding classes, since the class corresponding to the interpolated value would likely have no meaning in that context.

BRIEF DESCRIPTION OF EMBODIMENTS

According to a first aspect of the present invention, there is provided a method for decoding descriptive information for each element of a given set of elements, said set of elements corresponding to a sample of a signal with one or more dimensions, the method comprising: receiving zone information specifying multiple elements of the rendition of the signal belonging to a zone; receiving descriptive information associated with the zone, the descriptive information encoded to indicate information pertaining to the multiple elements in the zone; and for each respective element in the zone, utilizing the descriptive information to derive a corresponding value, the corresponding value indicating information pertaining to the respective element.

According to a second aspect of the present invention, there is provided a method to reproduce a rendition of a signal, the method comprising: via computer processor hardware: receiving zone information specifying multiple elements of the rendition of the signal

belonging to a zone; receiving motion information associated with the zone, the motion information encoded to indicate to which corresponding element in a reference signal each of the multiple elements in the zone pertains; and for each respective element in the zone, utilizing the motion information to derive a corresponding location value in the reference signal, the corresponding location value indicating a location in the reference signal to which the respective element pertains.

According to the third aspect of the present invention, there is provided a method to reproduce information for each element of a rendition of a signal, the method comprising: via computer processor hardware: receiving zone information specifying multiple elements of the rendition of the signal belonging to a zone; receiving descriptive information associated with the zone, the descriptive information encoded to indicate information pertaining to the multiple elements in the zone; and for each respective element in the zone, utilizing the descriptive information to derive a corresponding value, the corresponding value indicating information pertaining to the respective element.

Embodiments herein are directed to improvements in methods to estimate, encode and process auxiliary information such as, by way of non-limiting example, motion information (e.g., motion occurred between two neighbouring images of a time-based signal), hence supporting methods such as motion estimation, motion compensation, signal encoding, signal quality enhancement (e.g., denoising, super-resolution, etc.), signal interpolation (e.g., increase of frame-rate), special effects, computer graphics, medical imaging, computer vision, augmented reality applications, etc.

One embodiment herein includes a method for efficiently assigning accurate auxiliary information to each element of a signal, by assigning class information to arbitrary portions / patches of a signal ("motion zones", or more broadly "auxiliary zones") – with size