quantization errors in the quantized parameters of a block combine with one another in manners that are difficult to manage without multiple re-encodings and/or extremely complex quantization schemes. Avoiding block artifacts and guaranteeing maximum error control are particularly important features, especially in applications such as medical imaging or professional image/video production.

BRIEF DESCRIPTION

According to a first aspect of the present invention, there is provided a method comprising: via computer processing hardware: receiving a first set of adjustment values, the first set of adjustment values specifying adjustments to be made to a predicted rendition of a signal generated at a first level of quality to reconstruct a rendition of the signal at the first level of quality; processing the first set of adjustment values; and deriving a second set of adjustment values based on the first set of adjustment values and on a rendition of the signal at a second level of quality, the second level of quality lower than the first level of quality.

According to a second aspect of the present invention, there is provided a method comprising: via computer processing hardware: receiving setting information associated with a rendition of a signal at a first level of quality; receiving a set of adjustment values; producing a preliminary rendition of the signal at a second level of quality based on the setting information, the second level of quality higher than the first level of quality; and producing a secondary rendition of the signal at the second level of quality based on the set of adjustment values and the preliminary rendition of the signal at the second level of quality.

According to a third aspect of the present invention, there is provided computer-readable storage hardware having instructions stored thereon, the instructions, when carried out by a processing device, causing the processing device to perform operations of: receiving a first set of adjustment values, the first set of adjustment values specifying adjustments to be made to a predicted rendition of a signal generated at a first level of quality to reconstruct a rendition of the signal at the first level of quality; processing the first set of adjustment values; and deriving a second set of adjustment values based on the first set of adjustment values and a rendition of the signal at a second level of quality, the second level of quality lower than the first level of quality.

According to a fourth aspect of the present invention, there is provided computer-readable storage hardware having instructions stored thereon, the instructions, when carried out by a processing device, causing the processing device to perform operations of: receiving setting information associated with a rendition of a signal at a first level of quality; receiving a set of adjustment values; producing a preliminary rendition of the signal at a second level of quality based on the setting information, the second level of quality higher than the first level of quality; and producing a secondary rendition of the signal at the second level of quality based on the set of adjustment values and the preliminary rendition of the signal at the second level of quality.

According to a fifth aspect of the present invention, there is provided a computer system comprising: computer processor hardware; and a hardware storage resource coupled to the computer processor hardware, the hardware storage resource storing instructions that, when executed by the computer processor hardware, causes the computer processor hardware to perform operations of: receiving a first set of adjustment values, the first set of adjustment values specifying adjustments to be made to a predicted rendition of a signal generated at a first level of quality to reconstruct a rendition of the signal at the first level of quality; processing the first set of adjustment values; and deriving a second set of adjustment values based on the first set of adjustment values and a rendition of the signal at a second level of quality, the second level of quality lower than the first level of quality.

According to a sixth aspect of the present invention, there is provided a computer system comprising: computer processor hardware; and a hardware storage resource coupled to the computer processor hardware, the hardware storage resource storing instructions that, when executed by the computer processor hardware, causes the computer processor hardware to perform operations of: receiving setting information associated with a rendition of a signal at a first level of quality; receiving a set of adjustment values; producing a preliminary rendition of the signal at a second level of quality based on the setting information, the second level of quality higher than the first level of quality; and producing a secondary rendition of the signal at the second level of quality based on the set of adjustment values and the preliminary rendition of the signal at the second level of quality.

Embodiments herein deviate with respect to conventional systems and methods, providing novel methods to quantize and/or transform element information (such as residual data) to

reconstruct a rendition of an image, enabling encoding methods characterized by efficient entropy coding, low computational complexity, parallelism, scalability, error control, etc. Methods and embodiments herein represent an innovative approach to achieve efficient entropy coding results with low computational complexity, parallelism, scalability, and error control.

According to its broadest aspect, embodiments herein include a method for transforming sets of signal elements (i.e., suitable sequences of values) into sets of transformed signal elements, so as to efficiently entropy encode them. Embodiments illustrated herein are especially focused on the non-limiting use case wherein said signal elements correspond to residual data to be added to a predicted (i.e., preliminary) rendition of an image in order to obtain a target rendition of the same image, said predicted rendition being obtained at least in part by upsampling and/or processing a rendition of the same image at a lower level of quality (e.g., with a lower level of fidelity vs. an original signal rendition). Embodiments illustrated herein are especially focused on non-limiting cases wherein a lower level of quality is a lower resolution (i.e., a coarser sampling grid) across one or more of the dimensions of the signal, although people skilled in the art can easily adapt the same methods to cases wherein a signal at a lower level of quality is a signal with the same resolution and a lower level of detail (e.g., without limitation, a coarser quantization of element values).

Embodiments herein are useful in conjunction with traditional encoding methods, and are useful in conjunction with tier-based encoding methods, a set of other novel methods that