[DESCRIPTION]
[Title of Invention] DECODER, ENCODER, DECODING METHOD, AND ENCODING METHOD

[Technical Field]
[0001]
The present disclosure relates to a decoder, an encoder, a decoding method, and an encoding method.

[Background Art]
[0002]
With advancement in video coding technology, from H.261 and MPEG-1 to H.264/AVC (Advanced Video Coding), MPEG-LA, H.265/HEVC (High Efficiency Video Coding) and H.266/VVC (Versatile Video Codec), there remains a constant need to provide improvements and optimizations to the video coding technology to process an ever-increasing amount of digital video data in various applications. The present disclosure relates to further advancements, improvements and optimizations in video coding.
[0003]
Note that Non Patent Literature (NPL) 1 relates to one example of a conventional standard regarding the above-described video coding technology.

Citation List
Non Patent Literature
[0004]
NPL 1: H.265 (ISO/IEC 23008-2 HEVC)/HEVC (High Efficiency Video Coding)

[Summary of Invention]
[Technical Problem]
[0005]
Regarding the encoding scheme as described above, proposals of new schemes have been desired in order to (i) improve coding efficiency, enhance image quality, reduce processing amounts, reduce circuit scales, or (ii) appropriately select an element or an operation. The element is, for example, a filter, a block, a size, a motion vector, a reference picture, or a reference block.
[0006]
Embodiments of the present disclosure provide, for example, a configuration or a method which can contribute to at least one of increase in coding efficiency, increase in image quality, reduction in processing amount, reduction in circuit scale, appropriate selection of an element or an operation, etc. It is to be noted that embodiments of the present disclosure may encompass possible configurations or methods which can contribute to advantages other than the above advantages.

[Solution to Problem]
[0007]
For example, a decoder according to a first aspect of the present

disclosure includes circuitry and memory coupled to the circuitry. In operation, the circuitry: decodes a plurality of sets of neural network information each of which identifies a neural network filter; decodes, from one access unit, two or more sets of activation information each of which specifies one set of neural network information among the plurality of sets of neural network information; and applies, to one picture, two or more neural network filters identified by two or more sets of neural network information specified by the two or more sets of activation information.

[0007a]

According to a second aspect of the present disclosure, there is provided an encoder including: circuitry; and memory coupled to the circuitry, wherein in operation, the circuitry: encodes a plurality of sets of neural network information each of which identifies a neural network filter; and encodes, into one access unit, two or more sets of activation information each of which specifies one set of neural network information among the plurality of sets of neural network information, and the two or more sets of activation information are used to apply, to one picture, two or more neural network filters identified by two or more sets of neural network information specified by the two or more sets of activation information.

[0007b]

According to a third aspect of the present disclosure, there is provided a decoding method including: decoding a plurality of sets of neural network information each of which identifies a neural network filter; decoding, from one access unit, two or more sets of activation information each of which specifies one set of neural network information among the plurality of sets of neural network information; and applying, to one picture, two or more neural network filters identified by two or more sets of neural network information specified by the two or more sets of activation information.

[0007c]

According to a fourth aspect of the present disclosure, there is provided an encoding method including: encoding a plurality of sets of neural network information each of which identifies a neural network filter; and encoding, into one access unit, two or more sets of activation information each of which specifies one set of neural network information among the plurality of sets of neural network information, wherein the two or more sets of activation information are used to apply, to one picture, two or more neural network filters identified by two or more sets of neural network information specified by the two or more sets of activation information.

[0008]

Each of embodiments, or each of part of constituent elements and methods in the present disclosure enables, for example, at least one of the following: improvement in coding efficiency, enhancement in image quality, reduction in processing amount of encoding/decoding, reduction in circuit scale, improvement in processing speed of encoding/decoding, etc. Alternatively, each of embodiments, or each of part of constituent elements and methods in the present disclosure enables, in encoding and decoding, appropriate selection of an element or an operation. The element is, for example, a filter, a block, a size, a motion vector, a reference picture, or a reference block. It is to be noted

that the present disclosure includes disclosure regarding configurations and methods which may provide advantages other than the above-described ones. Examples of such configurations and methods include a configuration or method for improving coding efficiency while reducing increase in processing amount.

[0009]

Additional benefits and advantages according to embodiments of the present disclosure will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various embodiments and features of the specification and drawings, and not all of which need to be provided in order to obtain one or more of such benefits and/or advantages.

[0010]

It is to be noted that these general or specific aspects may be implemented using a system, an integrated circuit, a computer program, or a computer readable medium (recording medium) such as a CD-ROM, or any combination of systems, methods, integrated circuits, computer programs, and media.

[Advantageous Effects of Invention]

[0011]

A configuration or method according to embodiments of the present disclosure enables, for example, at least one of the following: improvement in coding efficiency, enhancement in image quality, reduction in processing amount, reduction in circuit scale, improvement in processing speed, appropriate selection of an element or an operation, etc. It is to be noted that the configuration or method according to embodiments of the present disclosure may provide advantages other than the above-described ones.

[Brief Description of Drawings]

[0012]

[FIG. 1]

FIG. 1 is a schematic diagram illustrating one example of a configuration of a transmission system according to an embodiment.

[FIG. 2]

FIG. 2 is a diagram illustrating one example of a hierarchical structure of data in a stream.

[FIG. 3]

FIG. 3 is a diagram illustrating one example of a slice configuration.

[FIG. 4]

FIG. 4 is a diagram illustrating one example of a tile configuration.

[FIG. 5]

FIG. 5 is a diagram illustrating one example of an encoding structure in scalable encoding.

[FIG. 6]

FIG. 6 is a diagram illustrating one example of an encoding structure in scalable encoding.