

Solution to Problem

[0007a]

According to a first aspect of the present invention, there is provided an image processing device comprising: a control section configured to set, based on a first scaling list for a first layer, a second scaling list for a second layer decoded with reference to the first layer; and an inverse quantization section configured to inversely quantize transform coefficient data of the second layer using the second scaling list set by the control section.

[0007b]

According to a second aspect of the present invention, there is provided an image processing method comprising the steps of: setting based on a first scaling list for a first layer, a second scaling list for a second layer decoded with reference to the first layer; and inversely quantizing transform coefficient data of the second layer using the second scaling list set by the control section.

[0008]

~~According to an embodiment of the present disclosure, there is provided~~ Disclosed herein is an image processing device including a control section configured to set, based on a first quantization parameter offset set for a chroma component of a first layer, a second quantization parameter offset for a chroma component of a second layer decoded with reference to the first layer, and an inverse quantization section configured to inversely quantize transform coefficient data of the chroma component of the second layer using a quantization parameter computed using the second quantization parameter offset set by the control section.

[0009]

The image processing device mentioned above may be typically realized as an image decoding device that decodes an image.

[0010]

~~According to another embodiment of the present disclosure, there is provided~~
Disclosed herein is an image processing method including setting, based on a first quantization parameter offset set for a chroma component of a first layer, a second quantization parameter offset for a chroma component of a second layer decoded with reference to the first layer, and inversely quantizing transform coefficient data of the chroma component of the second layer using a quantization parameter computed using the set second quantization parameter offset.

[0011]

~~According to another embodiment of the present disclosure, there is provided~~
Disclosed herein is an image processing device including a quantization section configured to quantize transform coefficient data of a chroma component of a second layer encoded with reference to a first layer using a given quantization parameter, and an encoding section configured to encode a second quantization parameter offset of a chroma component of the second layer computed based on a first quantization parameter offset set for a chroma component of the first layer and the given quantization parameter.

[0012]

The image processing device mentioned above may be typically realized as an image encoding device that encodes an image.

[0013]

~~According to another embodiment of the present disclosure, there is provided~~
Disclosed herein is an image processing method including quantizing transform coefficient data of a chroma component of a second layer encoded with reference to a first layer using a given quantization parameter, and encoding a second quantization parameter offset of the chroma component of the second layer computed based on a first quantization parameter offset set for a chroma component of the first layer and the given quantization parameter.

Advantageous Effects of Invention

[0014]

According to ~~the technology relating to the present disclosure~~ embodiments of the present invention, in a multi-layer codec, coding efficiency can be enhanced by reusing a parameter relating to quantization in layers.

Brief Description of Drawings

[0015]

[FIG. 1] FIG. 1 is an illustrative diagram for describing scalable video coding.

[FIG. 2] FIG. 2 is an illustrative diagram for describing granularity of rate control.

[FIG. 3] FIG. 3 is an illustrative diagram showing an example of a relation between quantization parameters and quantization steps.

[FIG. 4] FIG. 4 is an illustrative diagram showing an example of a referential relation of blocks in in-CTB prediction and inter-CTB prediction.

[FIG. 5] FIG. 5 is a block diagram showing a schematic configuration of an image encoding device according to an embodiment.

[FIG. 6] FIG. 6 is a block diagram showing a schematic configuration of an image decoding device according to an embodiment.

[FIG. 7] FIG. 7 is a block diagram showing an example of a configuration of an EL

CLAIMS

Claim 1

1. An image processing device comprising:

a control section configured to set, based on a first scaling list quantization parameter offset set for a chroma component of a first layer, a second scaling list quantization parameter offset for a chroma component of a second layer decoded with reference to the first layer; and

an inverse quantization section configured to inversely quantize transform coefficient data of the chroma component of the second layer using the second scaling list quantization parameter computed using the second quantization parameter offset set by the control section.

Claim 2

— The image processing device according to claim 1, wherein the second quantization parameter offset is equal to the sum of the first quantization parameter offset and a quantization parameter offset difference.

Claim 3

— The image processing device according to claim 2, further comprising:

— a decoding section configured to decode the quantization parameter offset difference from an encoded stream.

Claim 4

— The image processing device according to claim 1, wherein the first quantization parameter offset is equal to the sum of an offset set for the first layer in a picture unit and an offset set for the first layer in a slice unit.

Claim 5

— The image processing device according to claim 1, wherein the first quantization parameter offset is equal to an offset set for the first layer in a picture unit.

Claim 6

— The image processing device according to claim 1, wherein the control section sets the second quantization parameter offset separately for a Cb component and a Cr component of the second layer.

Claim 7

— The image processing device according to claim 1, wherein, when a first flag

~~decoded from an encoded stream indicates that the second quantization parameter offset should be set based on the first quantization parameter offset, the control section sets the second quantization parameter offset based on the first quantization parameter offset.~~

~~Claim 8~~

~~—— The image processing device according to claim 1,
—— wherein, based on a first quantization matrix set for the first layer, the control section sets a second quantization matrix for the second layer, and
—— wherein the inverse quantization section inversely quantizes transform coefficient data of the second layer using the second quantization matrix set by the control section.~~

~~Claim 9~~

~~2. The image processing device according to claim 18, wherein, if when reference layer information specifies designates the first layer as a reference layer, the control section sets the second scaling listquantization matrix for the second layer based on the first scaling listquantization matrix set for the first layer.~~

~~Claim 10~~

~~3. The image processing device according to claim 18, wherein the control section duplicates or predicts the second scaling listquantization matrix from the first scaling listquantization matrix.~~

~~Claim 11~~

~~4. The image processing device according to claim 18, wherein, if when a second flag decoded from an encoded stream indicates specifies that the second scaling listquantization matrix should be is set based on the first scaling listquantization matrix, the control section sets the second scaling listquantization matrix based on the first scaling listquantization matrix.~~

~~Claim 12~~

~~5. The image processing device according to claim 114, wherein the second flag is decoded from the encoded stream separately for different scaling listquantization matrix sizes, different prediction modes, or different color components.~~

~~Claim 13~~

~~6. The image processing device according to claim 340, wherein the control section selects a setting technique for setting the second scaling listquantization matrix according to a ~~third~~ second flag decoded from an encoded stream.~~

Claim 14

7. The image processing device according to claim ~~13~~6, wherein the ~~third~~second flag is ~~extracted~~ decoded from the encoded stream separately for different scaling list~~quantization matrix~~ sizes, different prediction modes, or different color components.

8. The image processing device according to claim 4, wherein the flag is extracted from SPS (Sequence Parameter Set) and PPS (Picture Parameter Set) of the encoded stream.

Claim 15

~~—The image processing device according to claim 8;~~
~~—wherein the second layer is encoded in a High Efficiency Video Coding (HEVC) scheme, and~~
~~—wherein, when the first layer is encoded in an Advanced Video Coding (AVC) scheme, the control section sets the second quantization matrix having a size of 8×8 pixels or smaller for the second layer based on the first quantization matrix, and sets a third quantization matrix having a size of 16×16 pixels or greater for the second layer without being based on the first quantization matrix.~~

Claim 16

~~—An image processing method comprising:~~
~~—setting, based on a first quantization parameter offset set for a chroma component of a first layer, a second quantization parameter offset for a chroma component of a second layer decoded with reference to the first layer; and~~
~~—inversely quantizing transform coefficient data of the chroma component of the second layer using a quantization parameter computed using the set second quantization parameter offset.~~

Claim 17

~~—An image processing device comprising:~~
~~—a quantization section configured to quantize transform coefficient data of a chroma component of a second layer encoded with reference to a first layer using a given quantization parameter; and~~
~~—an encoding section configured to encode a second quantization parameter offset of a chroma component of the second layer computed based on a first quantization parameter offset set for a chroma component of the first layer and the given quantization parameter.~~

Claim 18

~~— The image processing device according to claim 17,~~
~~— wherein the quantization section quantizes transform coefficient data of the second layer using a given quantization matrix, and~~
~~— wherein, when a decoder should set the given quantization matrix for the second layer based on a quantization matrix set for the first layer, the encoding section refrains from encoding the given quantization matrix.~~

Claim 19

~~— The image processing device according to claim 18, wherein the encoding section encodes reference layer information which designates the first layer as a reference layer to be referred to when the given quantization matrix is set.~~

Claim 20

~~— An image processing method comprising:~~
~~— quantizing transform coefficient data of a chroma component of a second layer encoded with reference to a first layer using a given quantization parameter; and~~
~~— encoding a second quantization parameter offset of the chroma component of the second layer computed based on a first quantization parameter offset set for a chroma component of the first layer and the given quantization parameter.~~

9. An image processing method comprising the steps of:

— setting based on a first scaling list for a first layer, a second scaling list for a second layer decoded with reference to the first layer; and

— inversely quantizing transform coefficient data of the second layer using the second scaling list set by the control section.

10. The image processing method according to claim 9, wherein, if reference layer information specifies the first layer as a reference layer, the setting step sets the second scaling list for the second layer based on the first scaling list set for the first layer.

11. The image processing method according to claim 9, wherein the setting step duplicates or predicts the second scaling list from the first scaling list.

12. The image processing method according to claim 9, wherein, if a flag decoded from an encoded stream specifies that the second scaling list is set based on the first scaling list, the setting step sets the second scaling list based on the first scaling list.

13. The image processing method according to claim 12, wherein the flag is decoded from the encoded stream separately for different scaling list sizes, different prediction modes, or different color components.

14. The image processing method according to claim 11, wherein the setting step selects a setting technique for setting the second scaling list according to a second flag decoded from an encoded stream.

15. The image processing method according to claim 14, wherein the second flag is extracted from the encoded stream separately for different scaling list sizes, different prediction modes, or different color components.

16. The image processing method according to claim 12, wherein the flag is extracted from SPS (Sequence Parameter Set) and PPS (Picture Parameter Set) of the encoded stream.