[Non-Patent Literature 1] Benjamin Bross, Woo-Jin Han, Jens-Rainer Ohm, Gary J. Sullivan, Ye-Kui Wang, Thomas Wiegand, "High Efficiency Video Coding (HEVC) text specification draft 10 (for FDIS & Last Call)", JCTVC-L1003_v34, Joint Collaborative Team on Video Coding (JCT-VC) of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11 12th Meeting: Geneva, CH, 14-23 Jan. 2013.

Summary of Invention

Technical Problem

[0005]

However, as information on a level, which serves as a reference for determining whether a decoder can decode a stream, and a buffer capacity, only a value of the entire stream or a value of a layer unit is defined.

[0006]

Therefore, even in an application that decodes only a part of an entire image, determination of whether decoding is possible is performed by assuming a load when an entire screen is decoded. Accordingly, there is concern of an unnecessarily high level decoder being necessary. In addition, there is concern of applications to be delivered being unnecessarily limited accordingly.

[0007]

Embodiments of the present invention are made in view of the above-mentioned problems and can recognize performance necessary for decoding more accurately.

Solution to Problem

[0008]

According to a first aspect of the present invention, there is provided an image decoding device comprising: an acquisition unit configured to acquire information indicating a size of a partial region of an image and a level indicating a load of a decoding process of the partial region of the image; a control unit configured to control decoding of coded data in which the image is coded based on the information indicating the size of the partial region of the image and the level indicating the load of the decoding process of the partial region; and a

decoding unit configured to decode the coded data under control of the control unit.

[0009]

The partial region may be independently decodable.

[0010]

The decoding load definition information may include information for defining a load of a decoding process of the partial region according to a level indicating a load of the decoding process.

[0011]

The decoding load definition information may include information for defining a load of a decoding process of the partial region according to information indicating a size of the partial region.

[0012]

The decoding load definition information may include information for defining a load of a decoding process of the partial region according to information indicating a length in a vertical direction and information indicating a length in a horizontal direction of the partial region.

[0013]

The decoding load definition information may be included in supplemental enhancement information (SEI) of an independently decodable partial region.

[0014]

The image data may include a plurality of layers, and the decoding load definition information of the plurality of layers may be included in the SEI.

[0015]

The decoding load definition information may include information indicating a size of the partial region, and a level indicating a load of a decoding process of the partial region.

[0016]

The partial region may be a tile.

[0017]

The partial region may be a set of a plurality of tiles.

[0018]

The decoding load definition information may include information for defining a maximum load of a decoding process among a plurality of partial regions included in a picture of the image data according to a level indicating a load of the decoding process.

[0019]

The decoding load definition information may include information for defining a load common in a plurality of partial regions included in a picture of the image data according to a level indicating a load of the decoding process.

[0020]

When the plurality of partial regions included in the picture have an L shape, the load may be defined for a rectangular region including the L shape.

[0021]

The acquisition unit may further acquire information indicating whether the decoding load definition information is set, and when the acquired information indicates that the decoding load definition information is set, acquires the the decoding load definition information.

[0022]

According to a second aspect of the present invention, there is provided an image decoding method comprising: acquiring information indicating a size of a partial region of an image and a level indicating a load of a decoding process of the partial region of the image; controlling decoding of coded data in which the image is coded based on the information indicating the size of the partial region of the image and the level indicating the load of the decoding process of the partial region; and decoding the coded data according to the controlling step.

[0023]

In embodiments of the present invention, coded data of image data and decoding load definition information for defining a magnitude of a load of a decoding process of a partial region of an image of the image data are acquired; decoding of the acquired coded data is controlled based on the acquired decoding load definition information; and the acquired coded data is decoded according to the controlling.

Advantageous Effects of Invention

[0024]

According to embodiments of the present invention, it is possible to code and decode an image. In particular, it is possible to recognize performance necessary for decoding more accurately.

Brief Description of Drawings

[0025]

[FIG. 1] FIG. 1 is a diagram describing an exemplary configuration of a coding unit.

[FIG. 2] FIG. 2 is a diagram illustrating an example of a layered image encoding scheme.

[FIG. 3] FIG. 3 is a diagram for describing an example of spatial scalable coding.

[FIG. 4] FIG. 4 is a diagram for describing an example of temporal scalable coding.

[FIG. 5] FIG. 5 is a diagram for describing an example of scalable coding of a signal-to-noise ratio.

[FIG. 6] FIG. 6 is a diagram describing an exemplary application that performs partial display.

[FIG. 7] FIG. 7 is a diagram describing another exemplary application that performs partial display.

[FIG. 8] FIG. 8 is a diagram describing an exemplary method of defining a decoding load to which the present technology is applied.

[FIG. 9] FIG. 9 is a diagram illustrating an extension example of MCTS SEI.

[FIG. 10] FIG. 10 is a diagram describing an overview of MCTS SEI.

[FIG. 11] FIG. 11 is a diagram describing an overview of MCTS SEI.

[FIG. 12] FIG. 12 is a diagram describing an overview of MCTS SEI.

[FIG. 13] FIG. 13 is a diagram describing an overview of MCTS SEI.

[FIG. 14] FIG. 14 is a diagram describing an overview of MCTS SEI.

[FIG. 15] FIG. 15 is a diagram describing an overview of MCTS SEI.

[FIG. 16] FIG. 16 is a diagram describing an overview of MCTS SEI.

CLAIMS

1. An image decoding device comprising:

an acquisition unit configured to acquire information indicating a size of a partial region of an image and a level indicating a load of a decoding process of the partial region of the image;

a control unit configured to control decoding of coded data in which the image is coded based on the information indicating the size of the partial region of the image and the level indicating the load of the decoding process of the partial region; and

a decoding unit configured to decode the coded data under control of the control unit.

2. The image decoding device according to claim 1,

wherein the partial region is independently decodable.

3. The image decoding device according to claim 1 or 2,

wherein the control unit controls decoding of the coded data using information for defining the load of a decoding process of the partial region according to a level indicating the load of the decoding process.

4. The image decoding device according to any one of the preceding claims,

wherein the control unit controls decoding of the coded data using information for defining the load of a decoding process of the partial region according to information indicating a size of the partial region.

5. The image decoding device according to any one of the preceding claims,

wherein the control unit controls decoding of the coded data using information for defining the load of a decoding process of the partial region according to information indicating a length in a vertical direction and information indicating a length in a horizontal direction of the partial region.

6. The image decoding device according to any one of the preceding claims, wherein the information indicating the size of the partial region of the image and the level indicating the load of the decoding process of the partial region of the image is acquired as decoding

load definition information indicating the load of a decoding process of the partial region,

wherein the control unit controls decoding of the coded data using the decoding load definition information acquired by the acquisition unit.

7. The image decoding device according to claim 6,

wherein the acquisition unit acquires the decoding load definition information as auxiliary information of the coded data.

8. The image decoding device according to claim 6 or 7,

wherein the acquisition unit acquires the decoding load definition information as supplemental enhancement information (SEI) of an independently decodable partial region.

9. The image decoding device according to claim 8,

wherein the image data includes a plurality of layers, and

wherein the acquisition unit acquires the decoding load definition information of the plurality of layers as the SEI.

10. The image decoding device according to any one of the preceding claims,

wherein the partial region is a tile.

11. The image decoding device according to any one of the preceding claims,

wherein the partial region is a set of a plurality of tiles.

12. The image decoding device according to any one of the preceding claims,

wherein the control unit controls decoding of the coded data using information for defining a maximum load of a decoding process among a plurality of partial regions included in a picture of the image data according to a level indicating the load of the decoding process.

13. The image decoding device according to any one of the preceding claims,

wherein the control unit controls decoding of the coded data using information for defining a load common in a plurality of partial regions included in a picture of the image data according to a level indicating the load of the decoding process.

14. The image decoding device according to claim 13,

wherein, when a plurality of the partial regions included in the picture have an L shape, the control unit controls decoding of the coded data using information for defining the load for a rectangular region including the L shape.

15. The image decoding device according to claim 6,

wherein the control unit controls decoding of the coded data using information indicating whether the decoding load definition information is set.

16. An image decoding method comprising:

acquiring information indicating a size of a partial region of an image and a level indicating a load of a decoding process of the partial region of the image;

controlling decoding of coded data in which the image is coded based on the information indicating the size of the partial region of the image and the level indicating the load of the decoding process of the partial region; and

decoding the coded data according to the controlling step.