[0008]

Embodiments of the present invention enable recognition of performance required for decoding more accurately.

Solution to Problem

[0009]

According to a first aspect of the present invention, there is provided an image decoding apparatus comprising: a decoding unit configured to decode encoded data of a partial region of an image included in a file based on a level corresponding to a load of decoding processing of the partial region of the image, wherein the partial region of the image is capable of being independently decoded, wherein the file includes the encoded data of the image and information defining metadata for the encoded data in which the level with respect to the partial region is set, and wherein the decoding unit is implemented via at least one processor.

[0010]

In an embodiment, the acquiring unit acquires subsample information including a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and the hint information.

[0011]

In an embodiment, the hint information includes a level indicating a degree of load of decoding processing of the subsample.

[0012]

In an embodiment, the hint information includes header information of the encoded data of the subsample.

[0013]

In an embodiment, the acquiring unit acquires subsample information including a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and identification information of a group to which the subsample belongs.

[0014]

In an embodiment, the acquiring unit further acquires subsample information including a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and hint information including a level indicating a degree of load of decoding processing of a group of a subsample.

[0015]

In an embodiment, the acquiring unit further acquires subsample information including a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and hint information including header information of encoded data of a group of a subsample.

[0016]

In an embodiment, the acquiring unit acquires subsample information including a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, identification information of a subsample belonging to a group, and hint information of the group.

[0017]

In an embodiment, the hint information includes a level indicating a degree of load of decoding processing of the group.

[0018]

In an embodiment, the hint information includes header information of encoded data of the group.

[0019]

In an embodiment, the acquiring unit acquires subsample information including information indicating a size and a location of a subsample.

[0020]

In an embodiment, the acquiring unit acquires subsample information including information indicating that a subsample can be independently decoded.

[0021]

In an embodiment, the acquiring unit acquires subsample information including information for grouping NAL units constituting a sample.

[0022]

In an embodiment, the acquiring unit acquires the subsample information arranged as a subsample hint information box (SubsampleHint Information Box) different from a subsample information box (Subsample Information Box) of a sample table box (Sample Table Box) of the management information of the file.

[0023]

In an embodiment, the acquiring unit acquires the subsample information arranged as a visual sample group entry (VisualSampleGroupEntry) in a sample group description box (Sample Group Description Box) of a sample table box (Sample Table Box) of the management information of the file and information designating a sample to which the subsample information is applied arranged in a sample to group box (Sample To Group Box).

[0024]

In an embodiment, the encoded data generating unit generates, when the decoding unit can decode the encoded data of the subsample, the encoded data of the subsample based on the hint information of the subsample information acquired by the acquiring unit.

[0025]

In an embodiment, the encoded data generating unit updates header information of the encoded data of the subsample based on the subsample information acquired by the acquiring unit.

[0026]

In an embodiment, the subsample is a tile (Tile) in high efficiency video coding (HEVC).

[0027]

According to a second aspect of the present invention, there is provided an image decoding method implemented via at least one processor, the method comprising: decoding encoded data of a partial region of an image included in a file based on a level corresponding to a load of decoding processing of the partial region of the image, wherein the partial region

of the image is capable of being independently decoded, and wherein the file includes the encoded data of the image and information defining metadata for the encoded data in which the level with respect to the partial region is set.

[0028]

According to a third aspect of the present invention, there is provided a non-transitory computer-readable medium having embodied thereon a program, which when executed by a computer, causes the computer to execute a method, the method comprising: decoding encoded data of a partial region of an image included in a file based on a level corresponding to a load of decoding processing of the partial region of the image, wherein the partial region of the image is capable of being independently decoded, and wherein the file includes the encoded data of the image and information defining metadata for the encoded data in which the level with respect to the partial region is set.

[0029]

[0030]

[0031]

Disclosed herein is an information processing method including: reproducing a file of an MP4 file format, in which information specifying a plurality of NAL units corresponding to a partial image which can be independently decoded in a whole image is stored in moov and the encoded partial image is stored in mdat.

[0032]

Disclosed herein is a file of an MP4 file format, in which information specifying a plurality of NAL units corresponding to a partial image which can be independently decoded in a whole image is stored in moov and the encoded partial image is stored in mdat, is generated, and the generated file is transmitted.

[0033]

Disclosed herein is a file of an MP4 file format, in which information specifying a plurality of NAL units corresponding to a partial image which can be independently decoded in a whole image is stored in moov and the encoded partial image is stored in mdat, is reproduced.

Advantageous Effects of Invention

[0034]

According to embodiments of the present invention, it is possible to encode and decode an image. Particularly, it is possible to recognize performance required for decoding more accurately.

Brief Description of Drawings

[0035]

[FIG. 1] FIG. 1 is a diagram for explaining an example of application for performing partial display.

[FIG. 2] FIG. 2 is a diagram for explaining another example of the application for performing partial display.

[FIG. 3] FIG. 3 is a diagram for explaining an example of definition of a subsample.

[FIG. 4] FIG. 4 is a diagram for explaining outline of an MP4 file format.

[FIG. 5] FIG. 5 is a diagram for explaining outline of an MP4 file format.

[FIG. 6] FIG. 6 is a diagram for explaining outline of an MP4 file format.

[FIG. 7] FIG. 7 is a diagram illustrating an extension example of a sample table box.

[FIG. 8] FIG. 8 is a diagram illustrating an example of a subsample hint information box.

[FIG. 9] FIG. 9 is a diagram illustrating an example of semantics of independent.

[FIG. 10] FIG. 10 is a diagram illustrating an example of a group of subsamples.

[FIG. 11] FIG. 11 is a diagram illustrating another example of the subsample hint information box.

[FIG. 12] FIG. 12 is a diagram illustrating another example of the subsample hint information box.

[FIG. 13] FIG. 13 is a diagram illustrating still another example of the subsample hint information box.

[FIG. 14] FIG. 14 is a diagram for explaining outline of an MP4 file format.

CLAIMS

1. An image decoding apparatus comprising:

a decoding unit configured to decode encoded data of a partial region of an image included in a file based on a level corresponding to a load of decoding processing of the partial region of the image,

wherein the partial region of the image is capable of being independently decoded,

wherein the file includes the encoded data of the image and information defining metadata for the encoded data in which the level with respect to the partial region is set, and

wherein the decoding unit is implemented via at least one processor.

2. The image decoding apparatus according to claim 1, further comprising:

an acquiring unit configured to acquire subsample information from a file including the encoded data of the image and management information of the encoded data in which the subsample information of an image of the image data is arranged, the subsample information including hint information used as a reference for decoding processing of a subsample; and

an encoded data generating unit configured to generate encoded data of the subsample from the encoded included in the file based on the subsample information acquired by the acquiring unit,

wherein the subsample information includes a hint type data indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and the hint information, and

wherein the acquiring unit and the encoded data generating unit are each implemented via at least one processor.

3. The image decoding apparatus according to claim 2,

wherein the hint information includes the level corresponding to the load of the decoding processing of the subsample.

4. The image decoding apparatus according to claim 2,

wherein the hint information includes header information of the encoded data of the subsample.

5. The image decoding apparatus according to claim 2,

wherein the subsample information includes a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and identification information of a group to which the subsample belongs.

6. The image decoding apparatus according to claim 2,

wherein the subsample information includes a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and hint information including a level corresponding to the load of the decoding processing of a group of a subsample.

7. The image decoding apparatus according to claim 2,

wherein the subsample information includes a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, and hint information including header information of encoded data of a group of a subsample.

8. The image decoding apparatus according to claim 2,

wherein the subsample information includes a hint data type indicating a type of hint information included in the subsample information, a sample count indicating the number of continuous samples associated with the subsample information, identification information of a subsample belonging to a group, and hint information of the group.

9. The image decoding apparatus according to claim 8,

wherein the hint information includes the level corresponding to the load of decoding processing of the group.

10. The image decoding apparatus according to claim 8,

wherein the hint information includes header information of encoded data of the group.

11. The image decoding apparatus according to claim 2,

wherein the subsample information includes information indicating a size and a location of a subsample.

12 The image decoding apparatus according to claim 2,

wherein the subsample information includes information indicating whether the subsample can be independently decoded.

13. The image decoding apparatus according to claim 2,

wherein the subsample information includes information for grouping NAL units constituting a sample.

14. The image decoding apparatus according to claim 2,

wherein the subsample information is arranged as a subsample hint information box (SubsampleHint Information Box) which is different from a subsample information box (Subsample Information Box) of a sample table box (Sample Table Box) of the management information of the file.

15 The image decoding apparatus according to claim 2,

wherein the subsample information is arranged as a visual sample group entry (VisualSampleGroupEntry) in a sample group description box (Sample Group Description Box) of a sample table box (Sample Table Box) of the management information of the file and information designating a sample to which the subsample information is applied is arranged in a sample to group box (Sample To Group Box).

16. The image decoding apparatus according to claim 2,

wherein the encoded data generating unit generates, when the decoding unit can

decode the encoded data of the subsample, the encoded data of the subsample based on the hint information of the subsample information acquired by the acquiring unit.

17. The image decoding apparatus according to claim 2,

wherein the encoded data generating unit updates header information of the encoded data of the subsample based on the subsample information acquired by the acquiring unit.

18. The image decoding apparatus according to claim 2,

wherein the subsample is a tile (Tile) in high efficiency video coding (HEVC).

19. An image decoding method implemented via at least one processor, the method comprising:

decoding encoded data of a partial region of an image included in a file based on a level corresponding to a load of decoding processing of the partial region of the image,

wherein the partial region of the image is capable of being independently decoded, and

wherein the file includes the encoded data of the image and information defining metadata for the encoded data in which the level with respect to the partial region is set.

20. A non-transitory computer-readable medium having embodied thereon a program, which when executed by a computer, causes the computer to execute a method, the method comprising:

decoding encoded data of a partial region of an image included in a file based on a level corresponding to a load of decoding processing of the partial region of the image,

wherein the partial region of the image is capable of being independently decoded, and

wherein the file includes the encoded data of the image and information defining metadata for the encoded data in which the level with respect to the partial region is set.