with the I_PCM mode is not disclosed therein.

[0019]

Embodiments of the present invention are directed to enhancing encoding efficiency while suppressing a decrease in the efficiency of encoding processing.

Solution to Problem

[0019a]

According to a first aspect of the present invention, there is provided an image processing apparatus including: a decoder adopted to decode, in units of coding units that are partial regions of an image of each picture and that have a hierarchical structure from a largest coding unit to a smallest coding unit, the encoded data including a coding unit for which a non-compression mode has been set as an encoding mode for encoding image data, the non-compression mode being an encoding mode in which the image data is output as encoded data; and a filter processing controller adapted to perform control, on the coding unit for which the non-compression mode has been set, to skip filter processing in which filtering is performed on a decoded image including the coding unit for which the non-compression mode has been set.

[0019b]

According to a second aspect of the present invention, there is provided an image processing method including: decoding, in units of coding units that are partial regions of an image of each picture and that have a hierarchical structure from a largest coding unit to a smallest coding unit,

the encoded data including a coding unit for which a non-compression mode has been set as an encoding mode for encoding image data, the non-compression mode being an encoding mode in which the image data is output as encoded data; and controlling, on the coding unit for which the non-compression mode has been set, to skip filter processing in which filtering is performed on a decoded image including the coding unit for which the non-compression mode has been set.

[0020]

Disclosed herein is an image processing apparatus. The image processing apparatus includes an encoding mode setter that sets, in units of coding units having a hierarchical structure, whether a non-compression mode is to be selected as an encoding mode for encoding image data, the non-compression mode being an encoding mode in which the image data is output as encoded data; and an encoder that encodes the image data in units of the coding units in accordance with a mode set by the encoding mode setter.

[0021]

The above disclosed image processing apparatus may further include a shift processing controller that performs control, on a coding unit for which the non-compression mode has been set by the encoding mode setter, to skip shift processing in which a bit precision for encoding or decoding is increased; and a shift processor that performs the shift processing on a coding unit of the image data, the coding unit being controlled by the shift processing controller so as to undergo the shift processing.

[0022]

The above disclosed image processing apparatus may further include a filter processing controller that performs control, on a coding unit for which the non-compression mode has been set by the encoding mode setter, to skip filter processing in which filtering is performed on a locally decoded image; a filter coefficient calculator that calculates a filter coefficient for the filter processing by using image data corresponding to a coding unit which is controlled by the filter processing controller so as to undergo the filter processing; and a filter processor that performs the filter processing in units of blocks, which are units of the filter processing, by using the filter coefficient calculated by the filter coefficient calculator.

[0023]

The filter processor may perform the filter processing on only pixels which are controlled by the filter processing controller so as to undergo the filter processing, the pixels being included in a current block which is a target to be processed.

[0024]

The above disclosed image processing apparatus may further include a filter identification information generator that generates filter identification information in units of the blocks, the filter identification information being identification information indicating whether the filter processing is to be performed.

[0025]

The filter processor may perform adaptive loop filtering on the locally decoded image, the adaptive loop filtering being adaptive filter processing using classification processing.

[0026]

In a case where an amount of code of encoded data, which is obtained by encoding the image data corresponding to a current coding unit as a target of encoding processing, is smaller than or equal to an amount of input data, which is a data amount of the image data corresponding to the current coding unit, the encoding mode setter may set an encoding mode of the current coding unit to be the non-compression mode.

[0027]

The above disclosed image processing apparatus may further include an input data amount calculator that calculates the amount of input data. The encoding mode setter may compare, regarding the current coding unit, the amount of input data calculated by the input data amount calculator with the amount of code.

[0028]

The above disclosed image processing apparatus may further include an identification information generator that generates identification information in units of the coding units, the identification information indicating whether the non-compression mode has been set by the encoding mode setter.

[0029]

Disclosed herein is an image processing method for an image processing apparatus. The image processing method

includes setting, with an encoding mode setter, in units of coding units having a hierarchical structure, whether a non-compression mode is to be selected as an encoding mode for encoding image data, the non-compression mode being an encoding mode in which the image data is output as encoded data; and encoding, with an encoder, the image data in units of the coding units in accordance with a set mode.

[0030]

Disclosed herein is an image processing apparatus. The image processing apparatus includes an encoding mode determiner that determines, in units of coding units having a hierarchical structure, whether a non-compression mode has been selected as an encoding mode for encoding image data, the non-compression mode being an encoding mode in which the image data is output as encoded data; and a decoder that decodes the encoding result in units of the coding units in accordance with a mode determined by the encoding mode determiner.

[0031]

The above disclosed image processing apparatus may further include a shift processing controller that performs control, on a coding unit for which the encoding mode determiner has determined that the non-compression mode has been selected, to skip shift processing in which a bit precision for encoding or decoding is increased; and a shift processor that performs the shift processing on a coding unit of the image data, the coding unit being controlled by the shift processing controller so as to undergo the shift processing.

[0032]

The above disclosed image processing apparatus may further include a filter processing controller that performs control, on a coding unit for which the encoding mode determiner has determined that the non-compression mode has been selected, to skip filter processing in which filtering is performed on a locally decoded image; and a filter processor that performs the filter processing on the image data in units of blocks, which are units of the filter processing. The filter processor may perform the filter processing on only pixels which have been controlled by the filter processing controller so as to undergo the filter processing, the pixels being included in a current block which is a target to be processed.

[0033]

The filter processor may perform adaptive loop filtering on the locally decoded image, the adaptive loop filtering being adaptive filter processing using classification processing.

[0034]

The filter processor may perform the filter processing, in a case where filter identification information indicating whether the filter processing has been performed indicates that the filter processing has been performed on image data corresponding to the current block which is a target to be processed, only when control is performed by the filter processing controller so as to perform the filter processing on all pixels included in the current block.

[0035]

The encoding mode determiner may determine whether the

non-compression mode has been selected, on the basis of identification information indicating whether the non-compression mode has been selected in units of the coding units.

[0036]

Disclosed herein is an image processing method for an image processing apparatus. The image processing method includes determining, with an encoding mode determiner, in units of coding units having a hierarchical structure, whether a non-compression mode has been selected as an encoding mode for encoding image data, the non-compression mode being an encoding mode in which the image data is output as encoded data; and decoding, with a decoder, the encoded data in units of the coding units in accordance with a determined mode.

[0037]

According to the above disclosure, whether a non-compression mode is to be selected as an encoding mode for encoding image data is set in units of coding units having a hierarchical structure, the non-compression mode being an encoding mode in which the image data is output as encoded data, and the image data is encoded in units of the coding units in accordance with a set mode.

[0038]

According to the above disclosure, whether a non-compression mode has been selected as an encoding mode for encoding image data is determined in units of coding units having a hierarchical structure, the non-compression mode being an encoding mode in which the image data is output as

encoded data, and the encoded data is decoded in units of the coding units in accordance with a determined mode.

## Advantageous Effects of Invention

[0039]

According to embodiments of the present invention, an image can be processed. In particular, encoding efficiency can be enhanced while suppressing a decrease in the efficiency of encoding processing.

## Brief Description of Drawings

[0040]

[Fig. 1] Fig. 1 is a block diagram illustrating an image encoding apparatus that outputs image compression information based on an AVC coding format.

[Fig. 2] Fig. 2 is a block diagram illustrating an image decoding apparatus that receives image compression information based on the AVC coding format.

[Fig. 3] Fig. 3 is a diagram illustrating an example of the type of macroblock.

[Fig. 4] Fig. 4 is a diagram describing an example configuration of coding units.

[Fig. 5] Fig. 5 is a diagram describing a method for increasing an amount of bits in internal arithmetic.

[Fig. 6] Fig. 6 is a diagram describing an adaptive loop filter.