example, improvement in encoding efficiency, a reduction in amount of encoding/decoding, a reduction in circuit size, acceleration of encoding/decoding, appropriate selection of constituent elements/operations, such as filters, blocks, size, motion vectors, reference pictures, and reference blocks, in encoding and decoding.

[0006]

It should be noted that the present disclosure includes configurations or methods that can produce benefits other than the above. Examples of those include a configuration or a method that improves encoding efficiency while suppressing an increase in amount of processing.

SOLUTIONS TO PROBLEMS

[0007]

According to a first aspect of the present disclosure, there is provided an encoder that encodes a video, the encoder including: circuitry; and memory connected to the circuitry, wherein, in operation, the circuitry: selects a first table to be used for a current partition to be encoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes; writes a parameter indicating a first index to be selected from among indexes included in the first table; and encodes the current partition using the base motion vector corrected using a correction value specified by the first index.

[0008]

According to a second aspect of the present disclosure, there is provided a decoder that decodes a video, the decoder including: circuitry; and memory connected to the circuitry, wherein, in operation, the circuitry: selects a first table to be used for a current partition to be decoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different

by a second value, different from the first value, in the two column locations specified by the two indexes; parses a parameter indicating a first index to be selected from among indexes included in the first table; and decodes the current partition using the base motion vector corrected using a correction value specified by the first index.

[0008a]

According to a third aspect of the present disclosure, there is provided an encoding method of encoding a video, the encoding method including: selecting a first table to be used for a current partition to be encoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes; writing a parameter indicating a first index to be selected from among indexes included in the first table; and encoding the current partition using the base motion vector corrected using a correction value specified by the first index.

[0008b]

According to a fourth aspect of the present disclosure, there is provided a decoding method of decoding a video, the decoding method including: selecting a first table to be used for a current partition to be decoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes; parsing a parameter indicating a first index to be selected from among indexes included in the first table; and decoding the current partition using the base motion vector corrected using a correction value specified by the first index.

[0008c]

According to a fifth aspect of the present disclosure, there is provided a decoder that decodes a video, the decoder including: circuitry; and memory connected to the circuitry, wherein, in operation, the circuitry: corrects a base motion vector using a correction value for correcting the base motion vector in a

predetermined direction; and decodes a current partition to be processed in an image of the video using the base motion vector corrected, wherein the correction value is specified by a first parameter indicating one of values included in a table, and the table is selected from among a plurality of tables, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes.

[0009]

It should be noted that these general or specific aspects may be implemented by a system, a device, a method, an integrated circuit, a computer program, or a non-transitory computer-readable recording medium such as a compact disc read only memory (CD-ROM), or by any combination of systems, devices, methods, integrated circuits, computer programs, or recording media.

[0010]

Additional benefits and advantages of the disclosed embodiments 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, not all of which need to be provided in order to obtain one or more of such benefits and/or advantages.

ADVANTAGEOUS EFFECT OF INVENTION

[0011]

Embodiments of the present disclosure provide an encoding device, a decoding device, an encoding method, and a decoding method that are capable of improving coding efficiency.

BRIEF DESCRIPTION OF DRAWINGS

[0012]

FIG. 1 is a block diagram illustrating a functional configuration of an encoder according to an embodiment.

FIG. 2 is a flow chart indicating one example of an overall encoding

CLAIMS

1. An encoder that encodes a video, the encoder comprising:

circuitry; and

memory connected to the circuitry,

wherein, in operation, the circuitry:

selects a first table to be used for a current partition to be encoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes;

writes a parameter indicating a first index to be selected from among indexes included in the first table; and

encodes the current partition using the base motion vector corrected using a correction value specified by the first index.

2. The encoder according to claim 1,

wherein the circuitry selects the first table by parsing a first parameter that specifies the first table among the plurality of tables.

3. The encoder according to claim 2,

wherein the circuitry obtains a slice header of a current slice including the current partition, and

the first parameter is written in the slice header.

4. The encoder according to claim 1,

wherein the circuitry selects the first table from among the plurality of tables using a motion vector in an encoded frame.

5. The encoder according to claim 1,

wherein the circuitry selects the first table from among the plurality of tables using a motion vector difference in an encoded frame.

6. The encoder according to claim 1,

wherein the circuitry selects the first table from among the plurality of tables using a resolution of a picture including the current partition.

7. The encoder according to claim 1,

wherein the circuitry selects the first table from among the plurality of tables using a temporal ID of a picture including the current partition.

8. The encoder according to claim 1,

wherein the circuitry selects the first table from among the plurality of tables using a distance between a current picture including the current partition and a reference picture.

9. The encoder according to claim 1,

wherein the circuitry selects the first table from among the plurality of tables using a value of a motion vector predictor in the current partition.

10. A decoder that decodes a video, the decoder comprising:

circuitry; and

memory connected to the circuitry,

wherein, in operation, the circuitry:

selects a first table to be used for a current partition to be decoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality

of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes;

parses a parameter indicating a first index to be selected from among indexes included in the first table; and

decodes the current partition using the base motion vector corrected using a correction value specified by the first index.

11. The decoder according to claim 10,

wherein the circuitry selects the first table by parsing a first parameter that specifies the first table among the plurality of tables.

12. The decoder according to claim 11,

wherein the circuitry obtains a slice header of a current slice including the current partition, and

the first parameter is written in the slice header.

13. The decoder according to claim 10,

wherein the circuitry selects the first table from among the plurality of tables using a motion vector in a decoded frame.

14. The decoder according to claim 10,

wherein the circuitry selects the first table from among the plurality of tables using a motion vector difference in a decoded frame.

15. The decoder according to claim 10,

wherein the circuitry selects the first table from among the plurality of tables using a resolution of a picture including the current partition.

16. The decoder according to claim 10,

wherein the circuitry selects the first table from among the plurality of tables using a temporal ID of a picture including the current partition.

17. The decoder according to claim 10,

wherein the circuitry selects the first table from among the plurality of tables using a distance between a current picture including the current partition and a reference picture.

18. The decoder according to claim 10,

wherein the circuitry selects the first table from among the plurality of tables using a value of a motion vector predictor in the current partition.

19. An encoding method of encoding a video, the encoding method comprising:

selecting a first table to be used for a current partition to be encoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes;

writing a parameter indicating a first index to be selected from among indexes included in the first table; and

encoding the current partition using the base motion vector corrected using a correction value specified by the first index.

20. A decoding method of decoding a video, the decoding method comprising:

selecting a first table to be used for a current partition to be decoded in an image of the video, from among a plurality of tables that are used to correct a base motion vector in a predetermined direction using a correction value specified by an index, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes;

parsing a parameter indicating a first index to be selected from among indexes included in the first table; and

decoding the current partition using the base motion vector corrected using a correction value specified by the first index.

21. A decoder that decodes a video, the decoder comprising:

circuitry; and

memory connected to the circuitry,

wherein, in operation, the circuitry:

corrects a base motion vector using a correction value for correcting the base motion vector in a predetermined direction; and

decodes a current partition to be processed in an image of the video using the base motion vector corrected,

wherein the correction value is specified by a first parameter indicating one of values included in a table, and

the table is selected from among a plurality of tables, wherein the plurality of tables are provided in a plurality of rows, respectively, and indexes specify column locations

in the plurality of tables, and the plurality of tables include correction values having varying differences between the column locations specified by the indexes such that the first table includes two correction values different by a first value in two column locations specified by two indexes and a second table, different from the first table, includes two correction values different by a second value, different from the first value, in the two column locations specified by the two indexes.