Claims

[Claim 1] A method of encoding a motion vector, the method comprising:
selecting, from among a first mode and a second mode, the first mode in which information indicating a motion vector predictor of at least one motion vector predictor is encoded or the second mode in which information indicating generation of a motion vector predictor based on pixels included in a previously encoded area adjacent to a current block is encoded;
determining a motion vector predictor of the current block according to the selected mode and encoding information about the motion vector predictor of the current block; and
encoding a difference vector between a motion vector of the current block and the motion vector predictor of the current block,
wherein the second mode is a mode in which information indicating generation of the motion vector predictor by setting a range within which the motion vector predictor is to be searched based on the at least one motion vector predictor and by searching within the search range by using pixels included in the previously encoded area, is encoded.

[Claim 2] The method of claim 1, wherein the selecting the first mode or the second mode comprises selecting the first mode or the second mode based on a depth indicating a degree of decreasing from a size of a maximum coding unit of a current picture or slice to a size of the current block.

[Claim 3] The method of claim 1, wherein the selecting the first mode or the second mode comprises selecting the first mode or the second mode in a unit of a current picture comprising the current block or in a unit of a slice comprising the current block.

[Claim 4] The method of claim 1, wherein the selecting the first mode or the second mode comprises selecting the first mode or the second mode based on whether the current block is encoded in a skip mode.

[Claim 5] The method of claim 1, wherein the at least one motion vector predictor comprises a first motion vector of a block adjacent to a left side of the current block, a second motion vector of a block adjacent to an upper side of the current block, and a third motion vector of a block adjacent to an upper-right side of the current block.

[Claim 6] The method of claim 5, wherein the at least one motion vector predictor further comprises a median value of the first motion vector, the second

motion vector, and the third motion vector.

[Claim 7] The method of claim 5, wherein the at least one motion vector predictor further comprises a motion vector predictor generated based on a motion vector of a block co-located with the current block in a reference picture and a temporal distance between the reference picture and a current picture.

[Claim 8] The method of claim 7, wherein the encoding the information about the motion vector predictor of the current block comprises encoding information indicating whether the block co-located with the current block is a block of a picture temporally preceding the current picture or a block of a picture temporally following the current picture.

[Claim 9] The method of claim 8, wherein the information indicating whether the block co-located with the current block is the block of the picture temporally preceding the current picture or the block of the picture temporally following the current picture is inserted into a header of a slice comprising the current block.

[Claim 10] An apparatus for encoding a motion vector, the apparatus comprising:
a prediction unit which selects, from among a first mode and a second, the first mode in which information indicating a motion vector predictor of at least one motion vector predictor is encoded or the second mode in which information indicating generation of a motion vector predictor based on pixels included in a previously encoded area adjacent to a current block is encoded;
a first encoder which determines a motion vector predictor of the current block according to the selected mode and encodes information about the motion vector predictor of the current block; and
a second encoder which encodes a difference vector between a motion vector of the current block and the motion vector predictor of the current block,
wherein the second mode is a mode in which information indicating generation of the motion vector predictor by setting a range within which the motion vector predictor is to be searched based on the at least one motion vector predictor and by searching within the search range by using pixels included in the previously encoded area, is encoded.

[Claim 11] A method of decoding a motion vector, the method comprising:
decoding information about a motion vector predictor of a current block encoded according to a mode selected from among a first mode and a second mode;

decoding a difference vector between a motion vector of the current block and the motion vector predictor of the current block;

generating the motion vector predictor of the current block based on the decoded information about the motion vector predictor of the current block; and

restoring the motion vector of the current block based on the generated motion vector predictor and the decoded difference vector,

wherein the first mode is a mode in which information indicating the motion vector predictor of at least one motion vector predictor is encoded and the second mode is a mode in which information indicating generation of the motion vector predictor by setting a range within which the motion vector predictor is to be searched based on the at least one motion vector predictor and by searching within the search range by using pixels included in a previously encoded area adjacent to the current block, is encoded.

[Claim 12] The method of claim 11, wherein the mode selected from among the first mode and the second mode is a mode selected based on a depth indicating a degree of decreasing in phases from a size of a maximum coding unit of a current picture or slice to a size of the current block.

[Claim 13] The method of claim 11, wherein the mode selected from among the first mode and the second mode is a mode selected in a unit of a current picture comprising the current block or a unit of a slice comprising the current block.

[Claim 14] An apparatus for decoding a motion vector, the apparatus comprising:

a first decoder which decodes information about a motion vector predictor of a current block encoded according to a mode selected from among a first mode and a second mode;

a second decoder which decodes a difference vector between a motion vector of the current block and the motion vector predictor of the current block;

a prediction unit which generates the motion vector predictor of the current block based on the decoded information about the motion vector predictor of the current block; and

a motion vector restorer which restores the motion vector of the current block based on the generated motion vector predictor and the decoded difference vector,

wherein the first mode is a mode in which information indicating the motion vector predictor of at least one motion vector predictor is

encoded and the second mode is a mode in which information indicating generation of the motion vector predictor by setting a range within which the motion vector predictor is to be searched based on the at least one motion vector predictor and by searching within the search range by using pixels included in a previously encoded area adjacent to the current block, is encoded.

[Claim 15] A computer readable recording medium having recorded thereon a computer program for executing the method of one of claims 1 through 9 and 11 through 13.

Claims

1. An apparatus for decoding an image, the apparatus comprising:

an image data acquisition unit which acquires image data encoded by using a coding unit of a hierarchical structure split from a maximum coding unit;

an encoding information extractor which obtains prediction mode information of a current block from a bitstream; and

an image data decoder which obtains motion vector predictor candidates of the current block using a block co-located with the current block in a reference picture in temporal direction when a prediction mode of the current block is inter-prediction, obtains a motion vector predictor of the current block among the obtained motion vector predictor candidates based on information indicating a motion vector predictor used for the current block and obtains a motion vector of the current block based on the obtained motion vector predictor and a differential vector obtained from the bitstream,

wherein the image is split into a plurality of maximum coding units according to information about a maximum size of the coding unit,

the maximum coding unit is hierarchically split into one or more coding units of depths including at least one of a current depth and a lower depth, and

a current coding unit of the current depth is one of rectangular data units split from a coding unit of an upper depth.

2. The apparatus of claim 1, wherein the image data decoder scales a motion vector of the block co-located with the current block in the reference picture based on a temporal distance between the reference picture and a current picture.