

CLAIMS

1. A method of determining a reference image for inter-prediction, the method comprising:

5 determining a slice type of a slice comprising a block;
if it is determined that the slice type is a B-slice type capable of uni-directional prediction or bi-directional prediction, determining an inter-prediction direction of the block to be one of a first direction, a second direction, and a bi-direction;

10 if the inter-prediction direction is not the second direction, determining a first direction reference index among a first direction reference picture list to be a reference index for the block; and

if the inter-prediction direction is not the first direction, determining that a second direction reference index among a second direction reference picture list is a reference index for the block.

15 2. The method of claim 1, wherein, if the inter-prediction direction is the bi-directional prediction, the first direction reference index is determined from the first direction reference picture list and the second direction reference index is determined from the second direction reference picture list.

20 3. The method of claim 1, wherein the determining of the first direction reference index comprises:

determining a difference value of a first motion vector indicating a reference image indicated by the first direction reference index; and

25 determining a motion vector predictor of which image is used from the first direction reference index, and

the determining of the second direction reference index comprises:

determining a difference value of a second motion vector indicating a reference image indicated by the second direction reference index; and

30 determining a motion vector predictor of which image is used from the second direction reference index.

4. The method of claim 1, further comprising:

determining inter-prediction mode information indicating that the inter-prediction

direction is in two bits;

selecting one of four context model indexes based on a depth of a coding unit of a current block, for a context model of a first bin from among two bins corresponding to the inter-prediction mode information in two bits; and

5 selecting one context model index independently from another symbol, for a context model of a second bin from among the two bins,

wherein the first bin indicates whether the inter-prediction direction is a uni-direction or a bi-direction, and the second bin indicates whether the uni-direction is the first direction or the second direction.

10 5. The method of claim 1, wherein the determining of the slice type comprises parsing slice type information of the slice from a slice header in a received bitstream,

the determining of the inter-prediction direction comprises:

15 parsing inter-prediction mode information indicating the inter-prediction direction from a prediction unit region comprising prediction information of the block in the received bitstream; and

reading which one of first direction prediction, second direction prediction, and bi-directional prediction is indicated by the inter-prediction mode information,

20 the determining of the first direction reference index comprises:

parsing the first direction reference index information and difference value information of the first motion vector from the prediction unit region comprising the prediction information of the block in the received bitstream; and

25 parsing information indicating a motion vector predictor of which image is used from the first direction reference index, and

the determining of the second direction reference index comprises parsing the second direction reference index information and difference value information of the second motion vector from the prediction unit region in the received bitstream.

30 6. The method of claim 4, further comprising restoring the inter-prediction mode information by performing entropy decoding using a context model determined for each bin on a bit string in a received bitstream, the bit string comprising the inter-prediction mode information.

7. The method of claim 5, further comprising:
parsing a reference index, a motion vector, and a residue per inter mode block
in the slice, from the received bitstream;
determining a reference picture indicated by the reference index in at least one
5 of the first direction reference picture list and the second direction reference picture list;
and
performing motion compensation and generating a restored image by using the
determined reference picture, the motion vector, and the residue per inter mode block.

10 8. The method of claim 1, further comprising:
inserting slice type information indicating the slice type into a slice header of the
slice;
inserting inter-prediction mode information indicating any one of first direction
prediction, second direction prediction, and bi-directional prediction into a prediction
15 unit region comprising prediction information of the block;
inserting the first direction reference index information and difference value
information of the first motion vector into the prediction unit region;
inserting the second direction reference index information and difference value
information of the second motion vector into the prediction unit region; and
20 transmitting a bitstream comprising the slice header and the prediction unit
region.

9. The method of claim 4, further comprising transmitting a bit string
generated by performing entropy decoding by using a context model determined for
25 each bin of the inter-prediction mode information.

10. The method of claim 8, further comprising:
performing motion prediction on the block by using reference pictures in at least
one of the first direction reference picture list and the second direction reference
30 picture list;
determining at least one reference picture comprising a most similar reference
block based on a result of the motion prediction;
determining the reference index indicating the determined at least one reference
picture from among the first direction reference picture list and the second direction

reference picture list;

determining a motion vector predictor of which image is used from the first and second direction reference indexes; and

inserting a motion vector and a residue indicating the determined at least one reference picture, and an inter-prediction direction and a reference index indicating the determined at least one reference picture into a block region of the bitstream,

wherein the determining of the first direction reference index comprises encoding the first direction reference index when the determined at least one reference picture does not belong to the second direction reference list, and

the determining of the second direction reference index comprises encoding the second direction reference index when the determined at least one reference picture does not belong to the first direction reference list.

11. An apparatus for determining a reference image, the apparatus comprising:

an inter-prediction direction determiner that determines a slice type of a slice comprising a block, and if the slice type is a B-slice type capable of uni-directional prediction or bi-directional prediction determines an inter-prediction direction of the block to be one of a first direction, a second direction, and a bi-direction; and

a reference index determiner that determines a first direction reference index from a first direction reference picture list as a reference index for the block if the inter-prediction direction is not the second direction, and determines a second direction reference index from a second direction reference picture list as a reference index for the block if the inter-prediction direction is not the first direction.

12. A method of determining a reference image for inter-prediction, the method comprising:

determining whether a temporal motion vector predictor is usable for a current slice of an image;

if the temporal motion vector predictor is usable in the current slice and the slice type is a B-slice type capable of uni-directional prediction or bi-directional prediction, determining whether a picture comprising a collocated block exists in a first direction reference picture list;

if the temporal motion vector predictor is not usable in the current slice,

determining index information of the picture comprising the collocated block from a predetermined reference picture list; and

determining a motion vector predictor of a current block by using a motion vector of the collocated block.

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13. The method of claim 12, further comprising:

determining a collocated image from the determined picture index, and determining a motion vector predictor of the current block based on a motion vector of the collocated block;

10 determining a motion vector of the current block by using the motion vector predictor; and

determining a reference block of the current block by using the motion vector.

14. The method of claim 12, wherein the determining of whether the picture comprising the collocated block exists in the first direction reference picture list comprises:

parsing information indicating usability of the temporal motion vector predictor from a slice header of the current slice;

20 if the temporal motion vector predictor is usable, parsing information from the slice header, the information indicating whether a picture comprising a collocated block exists in the first direction reference picture list and whether index information of the picture comprising the collocated block exists in a predetermined reference picture list.

15. The method of claim 12, wherein the determining of whether the picture comprising the collocated block exists in the first direction reference picture list comprises:

inserting information indicating usability of the temporal motion vector predictor into a slice header of the current slice; and

30 if the temporal motion vector predictor is usable, inserting information into the slice header, the information indicating whether a picture comprising a collocated block exists in the first direction reference picture list and whether index information of the picture comprising the collocated block exists in a predetermined reference picture list.

CLAIMS

1. A video decoding method comprising:
 - determining a depth of a current coding unit based on split information;
 - determining a first context model index according to the depth of the current coding unit;
 - obtaining a first bit indicating whether an inter-prediction mode of a current prediction unit in the current coding unit is a bi-prediction mode by performing arithmetic decoding on a bitstream by using the first context model index;
 - when the first bit does not indicate the bi-prediction mode, obtaining a second bit indicating whether the inter-prediction mode of the current prediction unit is an L0 prediction mode or an L1 prediction mode by performing arithmetic decoding on the bitstream by using a second context model index; and
 - performing one of bi-prediction, L0 prediction, and L1 prediction on the current prediction unit according to at least one of the first bit and the second bit.
2. The video decoding method of claim 1, wherein the depth of the current coding unit indicates a number of times a coding unit is split from a maximum coding unit to the current coding unit according to information about a maximum size of the coding unit.
3. The video decoding method of claim 1, wherein the second context model index is a predetermined constant.
4. A video decoding apparatus comprising:
 - an inter-prediction mode information receiver configured to obtain split information; and

a processor configured to determine a depth of a current coding unit based on the split information and determine a first context model index according to the depth of the current coding unit,

wherein the inter-prediction mode information receiver is further configured to:

obtain a first bit indicating whether an inter-prediction mode of a current prediction unit in the current coding unit is a bi-prediction mode by performing arithmetic decoding on a bitstream by using the first context model index;

when the first bit does not indicate the bi-prediction mode, obtain a second bit indicating whether the inter-prediction mode of the current prediction unit is an L0 prediction mode or an L1 prediction mode by performing arithmetic decoding on the bitstream by using a second context model index; and

perform one of bi-prediction, L0 prediction, and L1 prediction on the current prediction unit according to at least one of the first bit and the second bit.