[Citation List]

[Non Patent Literature]

[0003]

[NPL 1] ITU-T Recommendation H.264 "Advanced video coding for generic audiovisual services", March 2010

[NPL 2] JCT-VC, "WD3: Working Draft 3 of High-Efficiency Video Coding", JCTVC-E603, March 2011

[Summary of Invention]

[Technical Problem]

[0004]

It is still desirable to enhance error resistance in image coding and decoding in which inter prediction is used, beyond the above-described conventional technique.

[0005]

In view of this, embodiments~~the object~~ of the present invention~~is to~~ provide an image coding method and an image decoding method with which error resistance in image coding and image decoding using inter prediction is enhanced.

[Solution to Problem]

[0006]

Disclosed herein is an~~An~~ image coding method~~according to an aspect of the present invention is a method~~ for coding an image on a block-by-block basis to generate a bitstream, and includes: determining a maximum number of a merging candidate which is a combination of a prediction direction, a motion vector, and a reference picture index for use in coding of a current block; deriving a first merging candidate; determining whether or not a total number of the first merging candidate is smaller than the maximum number; deriving a second merging candidate when it is determined that the total number of the first merging candidate is smaller than the maximum number; selecting a merging candidate for use in the coding of the current block from the first merging candidate and the second merging

candidate; and coding, using the determined maximum number, an index for identifying the selected merging candidate, and attaching the coded index to the bitstream.

[0006a]

According to a first aspect, there is provided an image coding method for coding a current block included in a slice of the image, comprising: deriving a first candidate having a first motion vector that has been used to code a first block; determining whether or not a total number of one or more candidates having the first candidate is less than a maximum candidate number; deriving a second candidate having a second motion vector when the total number of one or more candidates having the first candidate is less than the maximum candidate number; and coding an index corresponding to a candidate having a motion vector, wherein the motion vector is used to code the current block, wherein the candidate is one of a plurality of candidates having the first candidate and the second candidate, and wherein the maximum candidate number embedded in a slice header for the slice is fixed for all blocks in the slice.

[0006b]

According to a second aspect, there is provided an image decoding method for decoding a current block included in a slice of the image, comprising: deriving a first candidate having a first motion vector that has been used to decode a first block; determining whether or not a total number of one or more candidates having the first candidate is less than a maximum candidate number; deriving a second candidate having a second motion vector when the total number of one or more candidates having the first candidate is less than the maximum candidate number; and decoding a coded index corresponding to a candidate having a motion vector, wherein the motion vector is used to decode the current block, wherein the candidate is one of a plurality of candidates having the first candidate and the second candidate, and wherein the maximum candidate number embedded in a slice header for the slice is fixed for all blocks in the slice.

[0006c]

According to a third aspect, there is provided an image coding apparatus that codes a current block included in a slice of the image, comprising: a first deriver configured to derive a first candidate having a first motion vector that has been used to code a first block; a determiner configured to determine whether or not a total number of one or more candidates having the first candidate is less than a maximum candidate number; a second deriver configured to derive a second candidate having a second motion vector when the total number of one or more candidates having the first candidate is less than the maximum candidate number; and a coder configured to code an index corresponding to a candidate having a motion vector, wherein the motion vector is used to code the current block, wherein the candidate is one of a plurality of candidates having the first candidate and the second candidate, and wherein the maximum candidate number embedded in a slice header for the slice is fixed for all blocks in the slice.

[0006d]

According to a fourth aspect, there is provided an image decoding apparatus that decodes a current block included in a slice of the image, comprising: a first deriver configured to derive a first candidate having a first motion vector that has been used to decode a first block; a determiner configured to determine whether or not a total number of one or more candidates having the first candidate is less than a maximum candidate number; a second deriver configured to derive a second candidate having a second motion vector when the total number of one or more candidates having the first candidate is less than the maximum candidate number; and a decoder configured to decode a coded index corresponding to a candidate having a motion vector, wherein the motion vector is used to decode the current block, and wherein the candidate is one of a plurality of candidates having the first candidate and the second candidate, and wherein the maximum candidate number embedded in a slice header for the slice is fixed for all blocks in the slice.

[0007]

It should be noted that these general or specific aspects can be implemented as a system, a method, an integrated circuit, a computer program, a computer-readable recording medium such as a compact disc read-only memory (CD-ROM), or as any combination of a system, a method, an integrated circuit, a computer program, and a computer-readable recording medium.

[Advantageous Effects of Invention]

[0008]

According to embodiments~~an aspect~~ of the present invention, error resistance in image coding and decoding using inter prediction can be enhanced.

[Brief Description of Drawings]

[0009]

[FIG. 1A] FIG. 1A is a diagram for illustrating an exemplary reference picture list for a B picture.

[FIG. 1B] FIG. 1B is a diagram for illustrating an exemplary reference picture list of a prediction direction 0 for a B picture.

[FIG. 1C] FIG. 1C is a diagram for illustrating an exemplary reference picture list of a prediction direction 1 for a B picture.

[FIG. 2] FIG. 2 is a diagram for illustrating motion vectors for use in the temporal motion vector prediction mode.

[FIG. 3] FIG. 3 shows an exemplary motion vector of a neighboring block for use in the merging mode.

[FIG. 4] FIG. 4 is a diagram for illustrating an exemplary merging block candidate list.

[FIG. 5] FIG. 5 shows a relationship between the size of a merging block candidate list and bit sequences assigned to merging block candidate indexes.

[FIG. 6] FIG. 6 is a flowchart showing an example of a process