[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]

However, there is a demand for the above conventional technique to achieve an improvement in error resistance in coding and decoding a moving picture using inter prediction.

[0005]

Embodiments~~In view of this, an object~~ of the present invention ~~is to~~ provide a moving picture coding method and a moving picture decoding method which improves error resistance in coding and decoding a moving picture using inter prediction.

[Solution to Problem]

~~[0006]~~

~~A moving picture coding method according to an aspect of the present invention is a moving picture coding method for calculating a motion vector predictor to be used when coding a motion vector of a current block, and coding the current block to generate a bitstream, the method including: obtaining motion vector predictor candidates a fixed number of which is two or more and each of which is a candidate for the motion vector predictor; selecting the motion vector predictor to be used for coding the motion vector of the current block, from among the motion vector predictor candidates the fixed number of which is two or more; and coding an index for identifying the selected motion vector predictor according to the fixed number of two or more, and adding the coded index to the bitstream, wherein the motion vector predictor candidates the fixed number of which is two or more~~

~~include one or more candidates each having a predetermined fixed value.~~

[0006]

According to a first aspect, there is provided a moving picture coding method for calculating a motion vector predictor to be used when coding a motion vector of a current block, and coding the current block to generate a bitstream, the method comprising: obtaining motion vector predictor candidates a fixed number of which is two or more and each of which is a candidate for the motion vector predictor; selecting the motion vector predictor to be used for coding the motion vector of the current block, from among the motion vector predictor candidates the fixed number of which is two or more; and coding an index for identifying the selected motion vector predictor according to the fixed number of two or more, and adding the coded index to the bitstream, wherein the motion vector predictor candidates the fixed number of which is two or more include a plurality of candidates each having a vector of value 0.

[0006a]

According to a second aspect, there is provided a moving picture decoding method for calculating a motion vector predictor to be used when decoding a motion vector of a current block included in a bitstream, and decoding the current block, the method comprising: obtaining motion vector predictor candidates a fixed number of which is two or more and each of which is a candidate for the motion vector predictor; decoding, according to the fixed number of two or more, an index for identifying the motion vector predictor candidate from among the motion vector predictor candidates the fixed number of which is two or more, the index being coded and added to the bitstream; and selecting, based on the decoded index, the motion vector predictor to be used for decoding the current block from among the motion vector predictor candidates the fixed number of which is two or more, wherein the motion vector predictor candidates the fixed number of which is two or more include a plurality of candidates each having a vector of value 0.

[0006b]

According to a third aspect, there is provided a moving picture coding apparatus for calculating a motion vector predictor to be used when coding a motion vector of a current block, and coding the current block to generate a bitstream, the apparatus comprising: a motion vector predictor candidate

obtaining unit configured to obtain motion vector predictor candidates a fixed number of which is two or more and each of which is a candidate for the motion vector predictor; a selection unit configured to select the motion vector predictor to be used for coding the motion vector of the current block, from among the motion vector predictor candidates the fixed number of which is two or more; and a coding unit configured to code an index for identifying the selected motion vector predictor according to the fixed number of two or more, and adding the coded index to the bitstream, wherein the motion vector predictor candidates the fixed number of which is two or more include a plurality of candidates each having a vector of value 0.

[0006c]

According to a fourth aspect, there is provided a moving picture decoding apparatus for calculating a motion vector predictor to be used when decoding a motion vector of a current block included in a bitstream, and decoding the current block, the apparatus comprising: a motion vector predictor candidate obtaining unit configured to obtain motion vector predictor candidates a fixed number of which is two or more and each of which is a candidate for the motion vector predictor; a decoding unit configured to decode, according to the fixed number of two or more, an index for identifying the motion vector predictor candidate from among the motion vector predictor candidates the fixed number of which is two or more, the index being coded and added to the bitstream; and a selection unit configured to select, based on the decoded index, the motion vector predictor to be used for decoding the current block from among the motion vector predictor candidates the fixed number of which is two or more, wherein the motion vector predictor candidates the fixed number of which is two or more include a plurality of candidates each having a vector of value 0.

[0006d]

According to a fifth aspect, there is provided a moving picture coding method for coding a current block, the moving picture coding method comprising: generating a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and coding an index corresponding to a candidate

having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[0006e]

According to a sixth aspect, there is provided a moving picture decoding method for decoding a current block, the moving picture decoding method comprising: generating a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and decoding a coded index corresponding to a candidate having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[0006f]

According to a seventh aspect, there is provided a motion vector predictor derivation method, comprising: generating a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and deriving a candidate having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[0006g]

According to an eighth aspect, there is provided a moving picture coding apparatus for coding a current block, the moving picture coding apparatus comprising: a generator configured to generate a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and a coder configured to code an index corresponding to a candidate having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[0006h]

According to a ninth aspect, there is provided a moving picture decoding apparatus for decoding a current block, the moving picture decoding apparatus comprising: a generator configured to generate a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and a decoder configured to decode a coded index corresponding to a candidate having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[0006i]

According to a tenth aspect, there is provided a motion vector predictor derivation apparatus, comprising: a generator configured to generate a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a

first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and a deriver configured to derive a candidate having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[0006j]

According to an eleventh aspect, there is provided an integrated circuit, comprising: a generator configured to generate a second candidate list that includes a plurality of candidates, the plurality of candidates including a first candidate and a second candidate, the first candidate having a first motion vector predictor that is a first zero vector, the second candidate having a second motion vector predictor that is a second zero vector; and a decoder configured to decode a coded index corresponding to a candidate having a motion vector predictor, the candidate being one of the plurality of candidates, wherein a first candidate list includes the first candidate and does not include the second candidate, and wherein, when a total number of one or more candidates in the first candidate list is less than a maximum candidate number, the second candidate is added to the first candidate list to generate the second candidate list.

[Advantageous Effects of Invention]

[0007]

According to embodiments~~an aspect~~ of the present invention, it is possible to improve error resistance in coding and decoding a moving picture using inter prediction.

[Brief Description of Drawings]

[0008]

[FIG. 1A] FIG. 1A is a diagram for describing an example of a reference picture list for a B-picture.

[FIG. 1B] FIG. 1B shows an example of a reference picture list for a prediction direction 0 for a B-picture.

[FIG. 1C] FIG. 1C shows an example of a reference picture list for a prediction direction 1 for a B-picture.

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

[FIG. 3] FIG. 3 shows examples of motion vectors of adjacent blocks used in a motion vector predictor designating mode.

[FIG. 4] FIG. 4 is a diagram for describing an example of a motion vector predictor candidate list for the prediction direction 0.

[FIG. 5] FIG. 5 is a diagram for describing an example of a motion vector predictor candidate list for the prediction direction 1.

[FIG. 6] FIG. 6 shows examples of assignment of bit strings to motion vector predictor indices.

[FIG. 7] FIG. 7 is a flowchart showing an example of coding processing performed when the motion vector predictor designating mode is used.

[FIG. 8A] FIG. 8A shows an example of calculation of a motion vector predictor.

[FIG. 8B] FIG. 8B shows an example of calculation of a motion vector predictor.

[FIG. 9] FIG. 9 is a block diagram showing an example of a