DESCRIPTION

Title

IMAGE CODING METHOD, IMAGE DECODING METHOD, IMAGE CODING APPARATUS, AND IMAGE DECODING APPARATUS

[Technical Field]

[0001]

The present invention relates to an image coding method for coding each of the blocks of pictures.

[Background Art]

[0002]

One exemplary technique for coding each of the blocks of pictures is the technique disclosed in Non-patent Literature 1.

[Citation List]

[Non Patent Literature]

[0003]

ISO/IEC 14496-10 "MPEG-4 Part 10 Advanced Video Coding"

[Summary of Invention]

[Technical Problem]

[0004]

However, in some cases, the conventional image coding method cannot achieve a sufficiently high coding efficiency.

[0005]

Embodiments of t~~T~~he present invention provides an image coding method which achieves an increased image coding efficiency.

[Solution to Problem]

~~[0006]~~

~~An image coding method according to an aspect of the present invention is an image coding method of coding each of blocks of pictures, the image coding method including: deriving a candidate for a motion vector predictor to be used in coding of a motion vector for a~~

~~current block to be coded, from a motion vector for a neighboring~~ block which is included in a current picture including the current block and is adjacent to the current block; adding the derived candidate to a list; selecting the motion vector predictor from the list including the added candidate; and coding the current block using the motion vector for the current block and a reference picture for the current block, and coding the motion vector for the current block using the selected motion vector predictor; wherein, in the deriving: whether the reference picture for the current block is a long-term reference picture or a short-term reference picture is determined, and whether a reference picture for the neighboring block is a long-term reference picture or a short-term reference picture is determined; and when each of the reference picture for the current block and the reference picture for the neighboring block is determined to be a long-term reference picture, the candidate is derived from the motion vector for the neighboring block according to a first derivation scheme which does not involve scaling based on a temporal distance, and when each of the reference picture for the current block and the reference picture for the neighboring block is determined to be a short-term reference picture, the candidate is derived from the motion vector for the neighboring block according to a second derivation scheme which ~~involves scaling based on a temporal distance.~~

[0006]

According to a first aspect, there is provided an image encoding method of encoding each block among blocks of pictures, the image encoding method comprising:

deriving a candidate for a motion vector predictor to be used in encoding of a motion vector for a current block to be encoded, from a first motion vector for a neighboring block which is included in a current picture including the current block and is adjacent to the current block;

adding the derived candidate to a list of candidates;

selecting one motion vector predictor from the list of candidates; and

encoding the current block using the motion vector for the current block and a reference picture for the current block, and encoding the motion vector for the current block using the selected motion vector predictor;

wherein the deriving includes:

determining whether the reference picture for the current block is a long-term reference picture or a short-term reference picture, and whether a first reference picture for the neighboring block is a long-term reference picture or a short-term reference picture; and

deriving the candidate from the first motion vector without scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a long-term reference picture, and

deriving the candidate from the first motion vector by scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a short-term reference picture.

[0006a]

According to a second aspect, there is provided an image decoding method of decoding each block among blocks of pictures, the image decoding method comprising:

deriving a candidate for a motion vector predictor to be used in decoding of a motion vector for a current block to be decoded, from a first motion vector for a neighboring block which is included in a current picture including the current block and is adjacent to the current block;

adding the derived candidate to a list of candidates;

selecting one motion vector predictor from the list of candidates; and

decoding the motion vector for the current block using the selected motion vector predictor, and decoding the current block using the motion vector for the current block and a reference picture for the current block,

wherein the deriving includes:

determining whether the reference picture for the current block is a long-term reference picture or a short-term reference picture, and whether a first reference picture for the neighboring block is a long-term reference picture or a short-term reference picture; and

deriving the candidate from the first motion vector without scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a long-term reference picture, and

deriving the candidate from the first motion vector by scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a short-term reference picture.

[0006b]

According to a third aspect, there is provided an image encoding apparatus which encodes each block among blocks of pictures, the image encoding apparatus comprising:

a deriving unit configured to derive a candidate for a motion vector predictor to be used in encoding of a motion vector for a current block to be encoded, from a first motion vector for a neighboring block which is included in a current picture including the current block and is adjacent to the current block;

an adding unit configured to add the derived candidate to a list of candidates;

a selecting unit configured to select one motion vector predictor from the list of candidates; and

an encoder configured to encode the current block using the motion vector for the current block and a reference picture for the current block, and encode the motion vector for the current block using the selected motion vector predictor;

wherein the deriving unit is configured to:

determine whether the reference picture for the current block is a long-term reference picture or a short-term reference picture, and whether a first reference picture for the neighboring block is a long-term reference picture or a short-term reference picture; and

derive the candidate from the first motion vector without scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a long-term reference picture, and

derive the candidate from the first motion vector by scaling based on a temporal distance when each of the

[0006c]

According to a fourth aspect, there is provided an image decoding apparatus which decodes each block among blocks of pictures, the image decoding apparatus comprising:

a deriving unit configured to derive a candidate for a motion vector predictor to be used in decoding of a motion vector for a current block to be decoded, from a first motion vector for a neighboring block which is included in a current picture including the current block and is adjacent to the current block;

an adding unit configured to add the derived candidate to a list of candidates;

a selecting unit configured to select one motion vector predictor from the list of candidates; and

a decoder configured to decode the motion vector for the current block using the selected motion vector predictor, and decode the current block using the motion vector for the current block and a reference picture for the current block,

wherein the deriving unit is configured to:

determine whether the reference picture for the current block is a long-term reference picture or a short-term reference picture, and whether a first reference picture for the neighboring block is a long-term reference picture or a short-term reference picture; and

derive the candidate from the first motion vector without scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a long-term reference picture, and

derive the candidate from the first motion vector by scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a short-term reference picture.

[0006d]

According to a fifth aspect, there is provided an image encoding and decoding apparatus comprising the above image encoding apparatus; and

an image decoding apparatus which decodes each block among blocks of pictures, and including:

a deriving unit configured to derive a candidate for a motion vector predictor to be used in decoding of a motion vector for a current block to be decoded, from a first motion vector for a neighboring block which is included in a current picture including the current block and is adjacent to the current block;

an adding unit configured to add the derived candidate to a list of candidates;

a selecting unit configured to select one motion vector predictor from the list of candidates; and

a decoder configured to decode the motion vector for the current block using the selected motion vector predictor, and decode the current block using the motion vector for the current block and a reference picture for the current block,

wherein the deriving unit is configured to:

determine whether the reference picture for the current block is a long-term reference picture or a short-term reference picture, and whether a first reference picture for the neighboring block is a long-term reference picture or a short-term reference picture; and

derive the candidate from the first motion vector without scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a long-term reference picture, and

derive the candidate from the first motion vector by scaling based on a temporal distance when each of the reference picture for the current block and the first reference picture for the neighboring block is determined to be a short-term reference picture.

[0006e]

According to a sixth aspect, there is provided a content providing method for transmitting image data from a server storing the image data encoded using the above image encoding method to an external terminal in response to a request from the external terminal.

[0007]

These general and specific aspects may be implemented using a system, an apparatus, an integrated circuit, a computer program, or a computer-readable recording medium such as a CD-ROM, or any combination of systems, apparatuses, methods, integrated circuits, computer programs, or computer-readable recording media.

[Advantageous Effects of Invention]

[0008]

The image coding method according to embodiments of the present invention achieves an increased image coding efficiency.

[Brief Description of Drawings]