Claims

1. A method of decoding an image, the method comprising:

obtaining a prediction mode of a current block from a bitstream;

when the prediction mode of the current block is inter-prediction, obtaining motion vector predictor candidates of the current block using at least one motion vector of neighboring blocks adjacent to the current block;

obtaining a motion vector predictor of the current block from among the motion vector predictor candidates based on a motion vector predictor information obtained from the bitstream; and

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

wherein the at least one motion vector of neighboring blocks is obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein the first scan order checks the neighboring blocks adjacent to the left side of the current block in vertical direction,

wherein the second scan order checks the neighboring blocks adjacent to the upper side of the current block in horizontal direction,

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

2. A method of encoding an image, the method comprising:

generating information indicating a prediction mode of a current block;

when the prediction mode of the current block is inter-prediction, obtaining motion vector predictor candidates of the current block using at least one motion vector of neighboring blocks adjacent to the current block;

determining a motion vector predictor of the current block from among the motion vector predictor candidates;

generating information indicating the motion vector predictor from among the motion vector predictor candidates; and

generating information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the at least one motion vector of neighboring blocks is obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein the first scan order checks the neighboring blocks adjacent to the left side of the current block in vertical direction,

wherein the second scan order checks the neighboring blocks adjacent to the upper side of the current block in horizontal direction,

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

3. A method of encoding a motion vector, the method comprising:

generating information indicating a prediction mode of a current block;

when the prediction mode of the current block is inter-prediction, obtaining motion vector predictor candidates of the current block by using at least one motion vector of neighboring blocks adjacent to the current block;

determining a motion vector predictor of the current block from among the motion vector predictor candidates;

generating information indicating the motion vector predictor from among the motion vector predictor candidates; and

generating information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the motion vector predictor candidates comprise a first motion vector predictor candidate obtained by searching for an available motion vector of the neighboring blocks adjacent to a left side of the current block according to a first scan order, and a second motion vector predictor candidate obtained by searching for an available motion vector of the neighboring blocks adjacent to an upper side of the current block according to a second scan order, and

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

4. A method of encoding an image, the method comprising:

generating information indicating a prediction mode of a current block;

when the prediction mode of the current block is inter-prediction, obtaining motion vector predictor candidates of the current block using at least one motion vector of neighboring blocks adjacent to the current block;

determining a motion vector predictor of the current block from among the motion vector predictor candidates;

generating information indicating the motion vector predictor from among the motion vector predictor candidates; and

generating information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the motion vector predictor candidates are obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein the first scan order checks the neighboring blocks adjacent to the left side of the current block in vertical direction,

wherein the second scan order checks the neighboring blocks adjacent to the upper side of the current block in horizontal direction,

wherein, from among the neighboring blocks adjacent to the upper side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the upper side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

5. A method of encoding an image, the method comprising:

generating information indicating a prediction mode of a current block;

when the prediction mode of the current block is inter-prediction, obtaining motion vector predictor candidates of the current block using at least one motion vector of neighboring blocks adjacent to the current block;

determining a motion vector predictor of the current block from among the motion vector predictor candidates;

generating information indicating the motion vector predictor from among the motion vector predictor candidates; and

generating information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the motion vector predictor candidates are obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein, from among the neighboring blocks adjacent to the upper side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the upper side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

6. A method of encoding an image, the method comprising:

generating information indicating a prediction mode of a current block;

when the prediction mode of the current block is inter-prediction, obtaining motion vector predictor candidates of the current block using at least one motion vector of neighboring blocks adjacent to the current block;

determining a motion vector predictor of the current block from among the motion vector predictor candidates;

generating information indicating the motion vector predictor from among the motion vector predictor candidates; and

generating information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates, and

wherein, from among the neighboring blocks adjacent to the upper side of the current block, when a third neighboring block having a motion vector referring to the first reference picture exists, a motion vector of the third neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the upper side of the current block, when the third neighboring block does not exist and a fourth neighboring block having a motion vector referring to a third reference picture other than the first reference picture exists, a motion vector of the fourth neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

7. A non-transitory computer-readable medium for recording a bitstream, the bitstream comprising:

information indicating a prediction mode of a current block, wherein the prediction mode is one of intra-prediction and inter-prediction;

information indicating a motion vector predictor from among motion vector predictor candidates, wherein when the prediction mode of the current block is inter-prediction, motion vector predictor candidates of the current block are obtained by using at least one motion vector of neighboring blocks adjacent to the current block; and

information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the at least one motion vector of neighboring blocks is obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein the first scan order checks the neighboring blocks adjacent to the left side of the current block in vertical direction,

wherein the second scan order checks the neighboring blocks adjacent to the upper side of the current block in horizontal direction,

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the

second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

8. A non-transitory computer-readable medium for recording a bitstream, the bitstream comprising:

information indicating a prediction mode of a current block, wherein the prediction mode is one of intra-prediction and inter-prediction;

information indicating a motion vector predictor from among motion vector predictor candidates, wherein when the prediction mode of the current block is inter-prediction, motion vector predictor candidates of the current block are obtained by using at least one motion vector of neighboring blocks adjacent to the current block; and

information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the motion vector predictor candidates comprise a first motion vector predictor candidate obtained by searching for an available motion vector of the neighboring blocks adjacent to a left side of the current block according to a first scan order, and a second motion vector predictor candidate obtained by searching for an available motion vector of the neighboring blocks adjacent to an upper side of the current block according to a second scan order, and

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

9. A non-transitory computer-readable medium for recording a bitstream, the bitstream comprising:

information indicating a prediction mode of a current block, wherein the prediction mode is one of intra-prediction and inter-prediction;

information indicating a motion vector predictor from among motion vector predictor candidates, wherein when the prediction mode of the current block is inter-prediction, motion vector predictor candidates of the current block are obtained by using at least one motion vector of neighboring blocks adjacent to the current block; and

information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the motion vector predictor candidates are obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a

first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein the first scan order checks the neighboring blocks adjacent to the left side of the current block in vertical direction,

wherein the second scan order checks the neighboring blocks adjacent to the upper side of the current block in horizontal direction,

wherein, from among the neighboring blocks adjacent to the upper side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the upper side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

10. A non-transitory computer-readable medium for recording a bitstream, the bitstream comprising:

information indicating a prediction mode of a current block, wherein the prediction mode is one of intra-prediction and inter-prediction;

information indicating a motion vector predictor from among motion vector predictor candidates, wherein when the prediction mode of the current block is inter-prediction, motion vector predictor candidates of the current block are obtained by using at least one motion vector of neighboring blocks adjacent to the current block; and

information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein the motion vector predictor candidates are obtained by searching for an available motion vector from the neighboring blocks adjacent to a left side of the current block according to a first scan order, and by searching for an available motion vector from the neighboring blocks adjacent to an upper side of the current block according to a second scan order,

wherein, from among the neighboring blocks adjacent to the upper side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the upper side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.

11. A non-transitory computer-readable medium for recording a bitstream, the bitstream comprising:

information indicating a prediction mode of a current block, wherein the prediction mode is one of intra-prediction and inter-prediction;

information indicating a motion vector predictor from among motion vector predictor candidates, wherein when the prediction mode of the current block is inter-prediction, motion vector predictor candidates of the current block are obtained by using at least one motion vector of neighboring blocks adjacent to the current block; and

information regarding a difference motion vector, wherein the difference motion vector is a difference between the motion vector predictor and a motion vector of the current block,

wherein, from among the neighboring blocks adjacent to the left side of the current block, when a first neighboring block having a motion vector referring to a first reference picture identical to a reference picture referred to by the current block exists, a motion vector of the first neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the left side of the current block, when the first neighboring block does not exist and a second neighboring block having a motion vector referring to a second reference picture other than the first reference picture exists, a motion vector of the second neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates, and

wherein, from among the neighboring blocks adjacent to the upper side of the current block, when a third neighboring block having a motion vector referring to the first reference picture exists, a motion vector of the third neighboring block is determined as the motion vector predictor candidates, and

from among the neighboring blocks adjacent to the upper side of the current block, when the third neighboring block does not exist and a fourth neighboring block having a motion vector referring to a third reference picture other than the first reference picture exists, a motion vector of the fourth neighboring block is scaled and the scaled motion vector is determined as the motion vector predictor candidates.