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 neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block,

wherein the first scan order indicates a scan order which scans the neighboring blocks adjacent to the left side of the current block from the lower left block to the upper block, and

wherein the second scan order indicates a scan order which scans the neighboring blocks adjacent to the upper side of the current block from right side to left side.

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 neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block,

wherein the first scan order indicates a scan order which scans the neighboring blocks adjacent to the left side of the current block from the lower left block to the upper

block, and

wherein the second scan order indicates a scan order which scans the neighboring blocks adjacent to the upper side of the current block from right side to left side.

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

wherein the neighboring block adjacent to the left side of the current block comprise a first neighboring block located on a lower-left side of the current block and a second neighboring block located on an upper side of the first neighboring block.

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 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 order,

wherein the neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block, and

wherein the first scan order indicates a scan order which scans the neighboring blocks adjacent to the left side of the current block from the lower left block to the upper block.

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 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 order,

wherein the neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block, and

wherein the second scan order indicates a scan order which scans the neighboring blocks adjacent to the upper side of the current block from right side to left side.

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 the obtaining motion vector predictor candidates of the current block comprises:

when a neighboring block, which has a motion vector referring to a first reference picture which is the same as the reference picture referred by the current block, is searched from among the neighboring blocks adjacent to a left side of the current block according to a first order, adding the motion vector referring to the first reference picture to the motion vector predictor candidates;

when no neighboring block, which has a motion vector referring to the first reference picture is searched from among the neighboring blocks adjacent to the left side of the current block, generating a motion vector predictor using at least one motion vector of at least one neighboring block referring to a second reference picture which is different from the first reference picture and adding the generated motion vector predictor to the

motion vector predictor candidates;

when a neighboring block, which has a motion vector referring to a first reference picture which is the same as the reference picture referred by the current block, is searched from among the neighboring blocks adjacent to a upper side of the current block according to a second order, adding the motion vector referring to the first reference picture to the motion vector predictor candidates; and

when no neighboring block, which has a motion vector referring to the first reference picture, is searched from among the neighboring blocks adjacent to the upper side of the current block, generating a motion vector predictor using at least one motion vector of at least one neighboring block referring to a second reference picture which is different from the first reference picture and adding the generated motion vector predictor to the motion vector predictor candidates,

wherein the neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block.

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 neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block,

wherein the first scan order indicates a scan order which scans the neighboring blocks adjacent to the left side of the current block from the lower left block to the upper block, and

wherein the second scan order indicates a scan order which scans the neighboring blocks adjacent to the upper side of the current block from right side to left side.

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

wherein the neighboring block adjacent to the left side of the current block comprise a first neighboring block located on a lower-left side of the current block and a second neighboring block located on an upper side of the first neighboring block.

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 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 order,

wherein the neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block, and

wherein the first scan order indicates a scan order which scans the neighboring blocks adjacent to the left side of the current block from the lower left block to the upper block.

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 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 order,

wherein the neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block, and

wherein the second scan order indicates a scan order which scans the neighboring blocks adjacent to the upper side of the current block from right side to left side.

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 the motion vector predictor candidates of the current block are obtained by:

when a neighboring block, which has a motion vector referring to a first reference picture which is the same as the reference picture referred by the current block, is searched from among the neighboring blocks adjacent to a left side of the current block according to a first order, the motion vector referring to the first reference picture is added to the motion vector predictor candidates;

when no neighboring block, which has a motion vector referring to the first reference picture is searched from among the neighboring blocks adjacent to the left side of the current block, a motion vector predictor is generated by using at least one motion vector of at least one neighboring block referring to a second reference picture which is different from the first reference picture and the generated motion vector predictor is added to the motion vector predictor candidates;

when a neighboring block, which has a motion vector referring to a first reference picture which is the same as the reference picture referred by the current block, is searched from among the neighboring blocks adjacent to a upper side of the current block according to a second order, the motion vector referring to the first reference picture is added to the motion vector predictor candidates; and

when no neighboring block, which has a motion vector referring to the first reference picture, is searched from among the neighboring blocks adjacent to the upper side of the current block, a motion vector predictor is generated by using at least one motion vector of at least one neighboring block referring to a second reference picture which is different from the first reference picture and the generated motion vector predictor is added to the motion vector predictor candidates,

wherein the neighboring blocks adjacent to the left side of the current block comprise a lower left block and an upper block located to the upper side of the lower left block.