What is claimed is:

1. A method of decoding motion information, the method comprising:

determining whether motion information of spatial prediction units that are spatially collocated to a current prediction unit and motion information of temporal prediction units that are temporally collocated to the current prediction are available;

as a result of the determining, when the number of the motion information of the spatial prediction units and the motion information of the temporal prediction units is less than a predetermined number 'n' (where n is an integer), generating additional candidate motion information by using the available motion information of the spatial prediction units and the motion information of the temporal prediction units such that the total number of pieces of candidate motion information is 'n';

obtaining index information indicating single motion information from among the 'n' pieces of candidate motion information from a bitstream; and

obtaining motion information of the current prediction unit by using motion information indicated by the index.

2. The method of claim 1, wherein the determining comprises:

searching predetermined prediction units positioned above the current prediction unit in a predetermined scanning order and selecting motion information of a first upper prediction unit having available motion information as an upper spatial motion information candidate of the current prediction unit;

searching predetermined prediction units positioned on the left of the current prediction unit in a predetermined scanning order and selecting motion information of a first left prediction unit having available motion information as a left spatial motion information candidate of the current prediction unit; and

selecting motion information of a prediction unit of a previous picture selected from the previous picture, based on a prediction unit of a previous picture having the same location as the current prediction unit, as temporal motion information candidate of the current prediction unit,

wherein the generating of the additional candidate motion information is performed when the total number of pieces of candidate motion information obtained by using the upper spatial motion information candidate, the left spatial motion information candidate, and the temporal motion information candidate is less than 'n'.

3. The method of claim 2, wherein the generating of the additional candidate motion information comprises generating motion information of an available upper prediction unit that is searched for after a first upper prediction unit having available motion information is searched for, as the additional candidate motion information, in a predetermined scanning order.

4. The method of claim 2, wherein the generating of the additional candidate motion information comprises generating the additional candidate motion information having motion information of an available left prediction unit that is searched for after a first left prediction unit having available motion information is searched for, in the predetermined scanning order.

5. The method of claim 2, wherein the generating of the additional candidate motion information comprises scaling motion information of a prediction unit of a previous picture having motion information from among remaining prediction units of the previous picture except for a prediction unit of a first previous picture having available motion information and generating the additional candidate motion information, when prediction units of a previous picture, which is determined based on a prediction unit of a previous picture having the same location as the current prediction unit, are scanned in a predetermined scanning order.

6. The method of claim 1, wherein the determining comprises:

selecting motion information of predetermined spatial prediction units of which locations are previously determined from among predetermined prediction units positioned above and on the left of the current prediction unit, as a spatial motion information candidate of the current prediction unit;

selecting motion information of a prediction unit of a previous picture selected from the previous picture based on a prediction unit of a previous picture having the same location as the current prediction unit, as a temporal motion information candidate of the current prediction unit,

wherein the generating of the additional candidate motion information is performed when a total number of pieces of candidate motion information obtained by using the spatial motion information candidate and the temporal motion information candidate is less than 'n'.

7. The method of claim 1, wherein the generating of the additional candidate motion information comprises generating predetermined motion information that is previously determined, as the additional candidate motion information.

8. The method of claim 1, wherein the generating of the additional candidate motion information comprises, when motion information of the available spatial prediction units and temporal prediction units comprises bi-directional motion vector information of prediction of a direction L0 and a direction L1, generating the additional candidate motion information by adding or subtracting a predetermined offset to and from a motion vector of the prediction of the direction L0 and a motion vector of the prediction of the direction L1.

9. The method of claim 8, wherein, when a first reference picture used in the prediction of the direction L0 and a second reference picture used in the prediction of the direction L1 are positioned on the same location based on a current picture comprising the current prediction unit, the offset is added to the motion vector of the prediction of the direction L0 and the motion vector of the prediction of the direction L1, and

wherein, when the current picture is positioned between the first reference picture used in the prediction of the direction L0 and the second reference picture used in the prediction of the direction L1, the offset is added to the motion vector of the prediction of the direction L0 and a value obtained by multiplying the offset by -1 is added to the motion vector of the prediction of the direction L1.

10. The method of claim 1, wherein the generating of the additional candidate motion information comprises changing prediction directions of motion information of the available spatial prediction units and motion information of the available temporal prediction units to generate the additional candidate motion information.

11. The method of claim 10, wherein the generating of the additional candidate motion information comprises, when the motion information of the

available spatial prediction units and the motion information of the available temporal prediction units comprise bi-directional motion vector information of the prediction of the direction L0 and the prediction of the direction L1, generating the additional candidate motion information by using uni-directional motion information of one selected from the direction of the direction L0 and the direction of the direction L1.

12. The method of claim 10, wherein the generating of the additional candidate motion information comprises, when motion information of the available spatial prediction units and motion information of the available temporal prediction units comprise uni-directional motion information of one selected from the direction of the direction L0 and the direction of the direction L1, generating the additional candidate motion information by using bi-directional motion information obtained by combining the prediction of the direction L0 and the prediction of the direction L1.

13. The method of claim 10, wherein the generating of the additional candidate motion information comprises, when motion information of the available spatial prediction units and motion information of the available temporal prediction units comprise uni-directional motion information of one selected from the direction of the direction L0 and the direction of the direction L1, generating bi-directional motion information generated by combining uni-directional motion information comprising a motion vector having a predetermined component value, as the additional candidate motion information.

14. The method of claim 1, wherein, in the generating of the additional candidate motion information, whether default candidate motion information and the generated additional candidate motion information are duplicated is not checked, and the generated additional candidate motion information is added to candidate motion information.

15. A method of encoding motion information, the method comprising:

performing motion prediction on a current prediction unit to obtain motion information about the current prediction unit;

determining whether motion information of spatial prediction units that are spatially collocated to a current prediction unit and motion information of temporal prediction units that are temporally collocated to the current prediction are available;

as a result of the determining, when the number of the motion information of the spatial prediction units and the motion information of the temporal prediction units is less than a predetermined number 'n' (where n is an integer), generating additional candidate motion information by using the available motion information of the spatial prediction units and the motion information of the temporal prediction units such that the total number of pieces of candidate motion information is 'n'; and

encoding motion information of the current prediction unit by using the 'n' pieces of motion information.

Claims

1. An apparatus configured to decode an image, the apparatus comprising:

an entropy decoder which obtains a prediction mode of a current block, from a bitstream;

a generating unit which, when the prediction mode of the current block is inter-prediction, obtains a spatial motion vector predictor candidate of the current block by using a motion vector of an available spatial prediction unit spatially related to the current block, obtains a temporal motion vector predictor candidate of the current block by using a motion vector of an available temporal prediction unit temporally related to the current block and when a number of spatial motion vector predictor candidates and temporal motion vector predictor candidates is smaller than a predetermined number n, where n is an integer equal to or greater than two, adds a zero vector to motion vector predictor candidates so that a total number of motion vector predictor candidates is the predetermined number n; and

a motion information decoder which obtains information indicating a motion vector predictor among the motion vector predictor candidates from the bitstream, and obtains a motion vector predictor of the current block based on the information.