CLAIMS

1. An offset adjustment method for video decoding, the method comprising:

extracting offset mergence information of a current largest coding unit (LCU) from among LCUs of a video from a received bitstream, the offset mergence information indicating whether to adopt a second offset parameter of a left or upper LCU of the current LCU as a first offset parameter of the current LCU;

reconstructing the first offset parameter of the current LCU based on the offset mergence information, the first offset parameter including an offset type, an offset value, and an offset class of the current LCU;

determining whether a pixel value classification method of the current LCU is an edge type or a band type, based on the offset type;

determining an edge direction according to the edge type or a band range according to the band type, based on the offset class;

determining a difference value between reconstructed pixels and original pixels included in the offset class, based on the offset value; and

adjusting pixel values of reconstructed pixels reconstructed based on coding units split from the current LCU and having a tree structure, by the difference value.

2. The method of claim 1, wherein the determining of whether the pixel value classification method of the current LCU is the edge type or the band type further comprises:

extracting an off type indicating whether an offset adjustment technique is applied to the current LCU, based on the offset type; and

if the offset adjustment technique is applied to the current LCU based on the extracted off type, extracting other offset parameters.

3. The method of claim 1, wherein the determining of the first offset parameter comprises determining offset values corresponding to a predetermined number of categories, and

wherein each of the offset parameters is greater than or equal to a preset minimum value and is less than or equal to a preset maximum value.

4. The method of claim 1, wherein the determining of the edge direction or the band range comprises, if the offset type is the edge type, determining a direction of an edge formed between a current reconstructed pixel and adjacent reconstructed pixels included in the current LCU as 0°, 90°, 45°, or 135°, based on the reconstructed offset class.

5. The method of claim 1, wherein the determining of the edge direction or the band range comprises, if the offset type is the band type, determining a position of a band to which the pixel values of the reconstructed pixels belong from among a plurality of bands obtained by dividing a total range of the pixel values, based on the reconstructed offset class.

6. The method of claim 3, wherein the determining of the difference value further comprises, if the offset type is the band type, determining whether the offset value is 0, based on zero value information of the reconstructed offset value, and

wherein the method further comprises, if the offset value is not 0 based on the zero value information, determining whether the offset value is a positive number or a negative number based on sign information of the reconstructed offset value, which is followed by the zero value information, and reconstructing a remainder followed by the sign information.

7. The method of claim 3, wherein the determining of the difference value further comprises, if the offset type is the edge type, determining whether the offset value is 0, based on zero value information of the reconstructed offset value, and

wherein the method further comprises, if the offset value is not 0 based on the zero value information, reconstructing a remainder of the reconstructed offset value, which is followed by the zero value information.

8. The method of claim 1, wherein the reconstructing of the first offset parameter comprises:

if the second offset parameter of the left or upper LCU is adopted as the first offset parameter based on the offset mergence information, not extracting first offset parameters of the current LCU and reconstructing the first offset parameter to be the same as the second offset parameter; and

if the second offset parameter of the left or upper LCU is not adopted as the first offset parameter based on the offset mergence information, extracting and reconstructing the first offset parameter followed by the offset mergence information from the bitstream.

9. The method of claim 1, wherein the reconstructing of the first offset parameter comprises reconstructing an offset parameter of a luma component, an offset parameter of a first chroma component, and an offset parameter of a second chroma component by using common offset mergence information of the current LCU.

10. The method of claim 1, wherein the reconstructing of the first offset parameter comprises reconstructing an offset type commonly applied to a first chroma component and a second chroma component of the current LCU.

11. An offset adjustment method for video encoding, the method comprising:

encoding of a current largest coding unit (LCU) from among LCUs of a video based on coding units split from the current LCU and having a tree structure;

determining a first offset parameter of the current LCU, the first offset parameter including an offset type indicating whether a pixel value classification method of the current LCU is an edge type or a band type, an offset class indicating an edge direction according to the edge type or a band range according to the band type, and an offset value indicating a difference value between reconstructed pixels and original pixels included in the offset class; and

outputting offset mergence information of the current LCU, the offset mergence information indicating whether to adopt a second offset parameter of a left or upper LCU of the current LCU as the first offset parameter based on sameness between the first offset parameter and the second offset parameter,

wherein the method further comprises, if the second offset parameter is not adopted as the first offset parameter, outputting the first offset parameter including the offset type, the offset value, and the offset class, which are followed by the offset mergence information of the current LCU.

12. The method of claim 11, wherein the outputting of the first offset parameter comprises outputting an off type indicating whether to apply an offset adjustment technique to the current LCU, as the offset type, and

wherein the method further comprises, if the offset adjustment technique is applied to the current LCU, outputting other offset parameters.

13. A video decoding apparatus for offset adjustment, the apparatus comprising:

an offset parameter extractor for extracting offset mergence information of a current largest coding unit (LCU) from among LCUs of a video from a received bitstream, the offset mergence information indicating whether to adopt a second offset parameter of a left or upper LCU of the current LCU as a first offset parameter of the current LCU, and reconstructing the first offset parameter of the current LCU based on the offset mergence information, the first offset parameter including an offset type, an offset value, and an offset class of the current LCU;

an offset determiner for determining whether a pixel value classification method of the current LCU is an edge type or a band type, based on the offset type, determining an edge direction according to the edge type or a band range according to the band type, based on the offset class, and determining a difference value between reconstructed pixels and original pixels included in the offset class, based on the offset value; and

an offset adjuster for adjusting pixel values of reconstructed pixels reconstructed based on coding units split from the current LCU and having a tree structure, by the difference value.

14. A video encoding apparatus for offset adjustment, the apparatus comprising:

an encoder for encoding of a current largest coding unit (LCU) from among LCUs of a video based on coding units split from the current LCU and having a tree structure;

an offset parameter determiner for determining a first offset parameter of the current LCU, the first offset parameter including an offset type indicating whether a pixel value classification method of the current LCU is an edge type or a band type, an offset class indicating an edge direction according to the edge type or a band range according to the band type, and an offset value indicating a difference value between reconstructed pixels and original pixels included in the offset class; and

an offset parameter outputter for outputting offset mergence information of the current LCU, the offset mergence information indicating whether to adopt a second offset parameter of a left or upper LCU of the current LCU as the first offset parameter based on sameness between the first offset parameter and the second offset parameter,

wherein if the second offset parameter is not adopted as the first offset parameter, the offset parameter outputter outputs the first offset parameter including the offset type, the offset value, and the offset class, which are followed by the offset mergence information of the current LCU.

15. A computer-readable recording medium having recorded thereon a computer program for executing the method of one of claims 1 to 12.

Claims

1. A video decoding method comprising:

obtaining, from a bitstream, left offset merging information indicating whether an offset parameter of a current block is determined according to an offset parameter of a left block;

when the left offset merging information indicates that the offset parameter of the current block is determined according to the offset parameter of the left block, determining the offset parameter of the current block using the offset parameter of the left block;

when the left offset merging information indicates that the offset parameter of the current block is not determined according to the offset parameter of the left block, obtaining, from the bitstream, upper offset merging information indicating whether the offset parameter of the current block is determined according to an offset parameter of an upper block;

when the upper offset merging information indicates that the offset parameter of the current block is determined according to the offset parameter of the upper block, determining an offset parameter of the current block using the offset parameter of the upper block;

when the upper offset merging information indicates that the offset parameter of the current block is not determined according to the offset parameter of the upper block, obtaining, from the bitstream, offset parameter of the current block; and

compensating for samples of the current block by using offset values,

wherein the offset parameter includes at least one of an offset type information and the offset values,

the offset type information indicates the offset type or whether to apply the offset values to the current block, and

the offset type is one of a band offset type and an edge offset type.

2. The video decoding method of claim 1, wherein, when the offset merging information indicates that the offset type of the current block is identical to the offset type of the left block or the offset type of the upper block, the offset type of the current block is not obtained from the bitstream.