CLAIMS

1. A sample adaptive offset (SAO) adjustment method, the method comprising:

obtaining slice SAO parameters with respect to a current slice from a slice header of a received bitstream;

obtaining luma SAO use information for a luma component of the current slice and chroma SAO use information for chroma components thereof from among the slice SAO parameters;

determining whether to perform a SAO operation on the luma component of the current slice based on the obtained luma SAO use information; and

equally determining whether to perform the SAO adjustment on a first chroma component and a second chroma component of the current slice based on the obtained chroma SAO use information.

2. The method of claim 1, further comprising:

obtaining SAO parameters of largest coding units (LCUs) with respect to a current LCU from among LCUs of the current slice;

obtaining left SAO merging information from among the SAO parameters of the LCUs; and

determining whether to predict SAO parameters for a luma component and first and second chroma components of the current LCU by using a luma component and first and second chroma components of an upper LCU neighboring the current LCU based on the left SAO merging information.

3. The method of claim 2, wherein the determining of whether to predict the SAO parameters comprises:

If it is determined that the SAO parameters of the current LCU are not predicted by using SAO parameters of a left LCU based on the left SAO merging information, obtaining upper SAO merging information from among the SAO parameters of the LCUs; and

determining whether to predict the SAO parameters for the luma component and the first and second chroma components of the current LCU by using the luma

component and the first and second chroma components of the upper LCU neighboring the current LCU based on the upper SAO merging information.

4. The method of claim 2, further comprising:

obtaining luma SAO type information for a luma component of the current LCU and chroma SAO type information for chroma components thereof from among the SAO parameters of the LCUs;

determining whether to perform a SAO operation on the luma component of the current LCU based on the obtained luma SAO type information; and

equally determining whether to perform the SAO adjustment on a first chroma component and a second chroma component of the current LCU based on the obtained chroma SAO type information.

5. The method of claim 4, further comprising:

determining which one of an edge SAO adjustment and a band SAO adjustment is performed on the luma component of the current LCU based on the obtained luma SAO type information; and

determining which one of the edge SAO adjustment and the band SAO adjustment is performed on the first chroma component and the second chroma component of the current LCU based on the obtained chroma SAO type information.

6. The method of claim 5, further comprising: determining the same edge direction on the first chroma component and the second chroma component of the current LCU based on the obtained SAO parameters.

7. The method of claim 5, wherein the obtaining of the luma SAO type information and the chroma SAO type information comprises:

performing context-adaptive binary arithmetic coding (CABAC)-decoding on a first context bin of the luma SAO type information, and obtaining information indicating whether to perform the SAO adjustment on the luma component of the current LCU;

performing CABAC-decoding on remaining context bins of the luma SAO type information in a bypass mode, and obtaining information indicating which one of the edge SAO adjustment and the band SAO adjustment is performed on the luma component of the current LCU;

performing CABAC-decoding on a first context bin of the chroma SAO type information, and obtaining information indicating whether to perform the SAO adjustment on the chroma components of the current LCU; and

performing CABAC-decoding on remaining context bins of the chroma SAO type information in the bypass mode, and obtaining information indicating which one of the edge SAO adjustment and the band SAO adjustment is performed on the chroma components of the current LCU.

8. The method of claim 2, further comprising: performing CABAC-decoding by using the same context mode for the left SAO merging information and upper SAO merging information with respect to the luma component and the chroma components of the current LCU.

9. The method of claim 4, further comprising: performing CABAC-decoding in a bypass mode to obtain magnitude information of an offset from among the SAO parameters of the LCUs,

wherein the obtained magnitude information of the offset indicates offset magnitude within a range based on a bit depth of a video, and

wherein, if the bit depth is 8 bits, the offset magnitude is equal to greater than 0 and equal to or smaller than 7, and, if the bit depth is 10 bits, the offset magnitude is equal to greater than 0 and equal to or smaller than 31.

10. The method of claim 5, further comprising: if it is determined that the band SAO adjustment is performed on the current LCU, performing CABAC decoding on bits of invariable bit lengths in a bypass mode so as to obtain information regarding a band left start position from at least one piece of the obtained luma SAO type information and the obtained chroma SAO type information.

11. A SAO adjustment method, the method comprising:

determining whether to perform a SAO operation on a luma component of a current slice;

equally determining whether to perform the SAO adjustment on a first chroma component and a second chroma component of the current slice;

generating slice SAO parameters with respect to the current slice comprising luma SAO use information indicating whether to perform the SAO adjustment on the luma component of the current slice and chroma SAO use information indicating whether to perform the SAO adjustment on the first chroma component and the second chroma component; and

outputting a slice header comprising slice SAO parameters.

12. The method of claim 11, further comprising:

determining whether to predict SAO parameters for a luma component and first and second chroma components of a current LCU by using SAO parameters with respect to a luma component and first and second chroma components of a left LCU neighboring the current LCU based on LCUs of the current slice;

generating left SAO merging information for the current LCU based on the determination;

determining whether to predict the SAO parameters for the luma component and the first and second chroma components of the current LCU by using SAO parameters with respect to a luma component and first and second chroma components of an upper LCU neighboring the current LCU.

generating upper SAO merging information for the current LCU based on the determination; and

generating SAO parameters of LCUs with respect to the current LCU comprising at least one piece of the left SAO merging information and the upper SAO merging information.

13. A video decoding apparatus, the apparatus comprising:

a SAO parameter obtainer for obtaining slice SAO parameters with respect to a current slice from a slice header of a received bitstream, and obtaining luma SAO use information for a luma component of the current slice and chroma SAO use information for chroma components thereof from among the slice SAO parameters;

a SAO determiner for determining whether to perform a SAO operation on the luma component of the current slice based on the obtained luma SAO use information, and equally determining whether to perform the SAO adjustment on a first chroma component and a second chroma component of the current slice based on the obtained chroma SAO use information; and

a SAO adjuster for performing the SAO adjustment on the luma component and the first and second chroma components of the current slice reconstructed by performing decoding on encoded symbols of the current slice obtained from the received bitstream based on a determination of the SAO determiner.

14. A video encoding apparatus, the apparatus comprising:

an encoder for performing prediction, transformation, and quantization on a current slice of a viode and performing inverse prediction, inverse transformation, and motion compensation on quantized transformation coefficients;

a SAO determiner for determining whether to perform a SAO operation on a luma component of the current slice, and equally determining whether to perform the SAO adjustment on a first chroma component and a second chroma component of the current slice; and

a SAO parameter encoder for generating slice SAO parameters with respect to the current slice, the slice SAO parameters comprising luma SAO use information indicating whether to perform the SAO adjustment on the luma component and chroma SAO use information indicating whether to perform the SAO adjustment on the first chroma component and the second chroma component based on a determination of the SAO determiner, and generating a slice header comprising the slice SAO parameters.

15. A non-transitory computer-readable recording medium having recorded thereon a computer program for executing the method of claim 1 or 11.

Claims

1. A video decoding method comprising:

obtaining slice offset information indicating whether to apply an offset for a current slice;

when the slice offset information indicates that the offset is applied, obtaining left offset merging information of a current block among blocks included in the current slice by performing entropy decoding on a bitstream using a context mode;

when the left offset merging information indicates that an offset parameter of the current block is determined according to an offset parameter of a 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 upper offset merging information of the current block by performing entropy decoding on the bitstream using the context mode and;

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

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

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

the offset type information indicates an offset type or whether to apply an offset 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 upper offset merging information indicates that the offset parameter of the current block is determined according to the offset parameter of the upper block, the offset parameter of the current block is not obtained from the bitstream.