CLAIMS

1. A sample adaptive offset (SAO) decoding method comprising:

obtaining context-encoded leftward SAO merge information and context-encoded upward SAO merge information from a bitstream of a largest coding unit (LCU);

obtaining SAO on/off information context-encoded with respect to each color component, from the bitstream;

if the SAO on/off information indicates to perform SAO operation, obtaining absolute offset value information for each SAO category bypass-encoded with respect to each color component, from the bitstream; and

obtaining one of band position information and edge class information bypass-encoded with respect to each color component, from the bitstream.

2. The method of claim 1, wherein the obtaining of the SAO on/off information comprises, if the SAO on/off information indicates to perform SAO operation, further obtaining edge band identification information encoded in a bypass mode with respect to each color component, from the bitstream, and

wherein context decoding is performed on the SAO on/off information in a first bin of SAO type information of the LCU, and bypass decoding is performed on remaining bits of the SAO type information other than the SAO on/off information.

3. The method of claim 2, wherein the obtaining of the band position information or the edge class information comprises, if the obtained edge band identification information indicates a band type, obtaining the band position information bypass-encoded with respect to each color component, from the bitstream,

wherein the obtaining of the band position information comprises, if the absolute offset value information obtained for each SAO category is not 0, obtaining the band position information and offset sign information bypass-encoded with respect to each color component, from the bitstream, and

wherein the band position information is lastly obtained from among SAO parameters of the LCU.

4. The method of claim 2, wherein the obtaining of the band position information or the edge class information comprises, if the obtained edge band

identification information indicates an edge type, obtaining the edge class information bypass-encoded with respect to each color component, from the bitstream, and

wherein the edge class information comprises edge class information for a luma component and edge class information for a first chroma component, and the edge class information for the first chroma component is equally applied to a second chroma component.

5. The method of claim 2, wherein the SAO on/off information and the edge band identification information for a first chroma component are equally applied to a second chroma component, and

wherein the leftward SAO merge information and the upward SAO merge information are commonly applied to a luma component, and the first and second chroma components of the LCU.

6. The method of claim 1, wherein the obtaining of the leftward SAO merge information and the upward SAO merge information comprises:

determining a context-based probability model of the leftward SAO merge information, performing entropy decoding by using the determined probability model of the leftward SAO merge information, and thus reconstructing the leftward SAO merge information; and

determining a context-based probability model of the upward SAO merge information, performing entropy decoding by using the determined probability model of the upward SAO merge information, and thus reconstructing the upward SAO merge information, and

wherein the obtaining of the SAO on/off information comprises determining a context-based probability model of the SAO on/off information, performing entropy decoding by using the determined probability model of the SAO on/off information, and thus reconstructing the SAO on/off information.

7. The method of claim 3, wherein the obtaining of the absolute offset value information comprises determining a context-based probability model of the absolute offset value information, performing entropy decoding without using the determined probability model of the absolute offset value information, and thus reconstructing the absolute offset value information,

wherein the obtaining of the offset sign information and the band position information comprises:

performing entropy decoding without using a context-based probability model of the offset sign information, and thus reconstructing the offset sign information; and

performing entropy decoding without using a context-based probability model of the band position information, and thus reconstructing the band position information, and

wherein the obtaining of the edge class information comprises performing entropy decoding without using a context-based probability model of the edge class information, and thus reconstructing the edge class information.

8. A sample adaptive offset (SAO) encoding method comprising:

outputting 1 bit of leftward SAO merge information and 1 bit of upward SAO merge information of a largest coding unit (LCU), generated by performing context encoding on each of the leftward SAO merge information and the upward SAO merge information;

outputting 1 bit of SAO on/off information generated by performing context encoding on the SAO on/off information with respect to each color component;

if the SAO on/off information indicates to perform SAO operation, outputting a bitstream of absolute offset value information generated by performing bypass encoding on the absolute offset value information with respect to each color component and each SAO category; and

outputting a remaining bitstream generated by performing bypass encoding on one of band position information and edge class information with respect to each color component.

9. The method of claim 8, wherein the outputting of the 1 bit of the SAO on/off information comprises, if the SAO on/off information indicates to perform SAO operation, further outputting 1 bit of edge band identification information generated by performing bypass encoding on the edge band identification information with respect to each color component, and

wherein context encoding is performed on the SAO on/off information in a first bin of SAO type information of the LCU, and bypass encoding is performed on remaining bits of the SAO type information other than the SAO on/off information.

10. The method of claim 9, wherein the outputting of the remaining bitstream comprises, if the edge band identification information indicates a band type, outputting a bitstream of the band position information generated by performing bypass encoding on the band position information with respect to each color component,

wherein the outputting of the band position information comprises, if the absolute offset value information for each SAO category is not 0, outputting the generated bitstream of the band position information and a bitstream of offset sign information generated by performing bypass encoding on the offset sign information, and

wherein the band position information is lastly output from among SAO parameters of the LCU.

11. The method of claim 9, wherein the outputting of the remaining bitstream comprises, if the edge band identification information indicates an edge type, outputting a bitstream of the edge class information generated by performing bypass encoding on the edge class information with respect to each color component, and

wherein the edge class information comprises edge class information for a luma component and edge class information for a first chroma component, and the edge class information for the first chroma component is equally applied to a second chroma component.

12. The method of claim 9, wherein the SAO on/off information and the edge band identification information for a first chroma component are equally applied to a second chroma component, and

wherein the leftward SAO merge information and the upward SAO merge information are commonly applied to a luma component, and the first and second chroma components of the LCU.

13. A sample adaptive offset (SAO) decoding apparatus comprising:

an SAO context decoder for obtaining context-encoded leftward SAO merge information and upward SAO merge information and obtaining SAO on/off information context-encoded with respect to each color component, from a bitstream of a largest coding unit (LCU);

an SAO bypass decoder for, if the SAO on/off information indicates to perform SAO operation, obtaining absolute offset value information bypass-encoded with respect

to each color component and each SAO category, and obtaining one of band position information and edge class information bypass-encoded with respect to each color component, from the bitstream; and

an SAO operator for, if the SAO on/off information indicates to perform SAO operation, adjusting reconstructed values of the LCU for each SAO category based on the absolute offset value information by using the obtained information.

14. A sample adaptive offset (SAO) encoding apparatus comprising:

an SAO operator for performing SAO operation on a largest coding unit (LCU);

an SAO context encoder for generating and outputting a bitstream of leftward SAO merge information and a bitstream of upward SAO merge information of the LCU by performing context encoding on each of the leftward SAO merge information and the upward SAO merge information, and generating and outputting 1 bit of SAO on/off information by performing context encoding on the SAO on/off information with respect to each color component; and

an SAO bypass encoder for, if the SAO on/off information indicates to perform SAO operation, generating and outputting a bitstream of absolute offset value information by performing bypass encoding on the absolute offset value information with respect to each color component and each SAO category, and generating and outputting a remaining bitstream by performing bypass encoding on one of band position information and edge class information with respect to each color component.

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

CLAIMS

1. A sample adaptive offset (SAO) decoding method comprising:

obtaining context-encoded leftward SAO merge information and context-encoded upward SAO merge information from a bitstream of a largest coding unit (LCU);

obtaining SAO on/off information by performing context-decoding on a first bin of SAO type information of the LCU, from the bitstream; if the SAO on/off information indicates to perform SAO operation, performing bypass decoding on remaining bins of the SAO type information other than the SAO on/off information of the SAO type information of the LCU;

obtaining absolute offset value information of the LCU, from the bitstream, by performing bypass decoding; and

obtaining one of band position information and edge class information of the LCU, from the bitstream, by performing bypass decoding,

wherein the obtaining context-encoded leftward SAO merge information and context-encoded upward SAO merge information comprises:

obtaining leftward SAO merge information from a bitstream by performing context decoding;

when the leftward SAO merge information indicates that SAO parameters of a current LCU is determined by using SAO parameters of a left LCU, determining SAO parameters of color components of the left LCU to be adopted as SAO parameters of color components of the current LCU;

when the leftward SAO merge information indicates that SAO parameters of a current largest coding unit (LCU) is not determined by using the SAO parameters of a left LCU, obtaining upward SAO merge information from a bitstream by performing context decoding; and

when the upward SAO merge information indicates that the SAO parameters of the current LCU is determined by using SAO parameters of an upper LCU, determining SAO parameters of color components of the upper LCU to be adopted as the SAO parameters of color components of the current LCU,

the SAO parameter includes at least one of the SAO on/off information, the absolute offset value information, band position information and edge class information, and

the color components of the left LCU comprises a luma component, a first chroma component and a second chroma component.