information is transmitted independently between the components of Y, Cb, Cr, and therefore, there is a high amount of codes required for controlling the sample adaptive offset filter.

[0008]

The present disclosure is made in view of such circumstances, and the amount of codes required for controlling the sample adaptive offset filter can be reduced.

SOLUTIONS TO PROBLEMS

[0009]

~~According to a first aspect of the present invention, there is provided an image processing apparatus comprising: a decoding unit configured to generate an image by performing decoding processing on a coded stream; and a sample adaptive offset filter unit configured to apply sample adaptive offset filter to the image generated by the decoding unit in accordance with the type information indicating a type which is common to a type of a sample adaptive offset filter of a first color difference component of an image and a type of a sample adaptive offset filter of a second color difference component of the image.~~

According to a first aspect of the present invention, there is provided an image processing apparatus comprising: a decoding unit configured to generate an image by performing decoding processing on a coded stream; and a sample adaptive offset filter unit configured to apply sample adaptive offset filter to the image generated by the decoding unit in accordance with a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image.

[0010]

The type of the sample adaptive offset filter is common to a brightness component and a color difference component of the image.

[0011]

The type of the sample adaptive offset filter is common to color difference components of the image.

[0012]

The type of the offset filter is common to a first color difference component and a second color difference component.

applying an offset, the type of the offset filter corresponding to the second color difference component is a type for not applying an offset.

[0019]

A color space of the image is in a Y/Cb/Cr format.

[0020]

The image processing apparatus further includes a reception unit configured to receive the coded stream and type information indicating the type of the sample adaptive offset filter common between components of the image, and the decoding unit can use the type information received by the reception unit to decode the coded stream received by the reception unit.

[0021]

The image processing apparatus further includes a deblock filter unit configured to apply deblock filter to the image generated by the decoding unit, and the sample adaptive offset filter unit can apply sample adaptive offset filter on the image to which the deblock filter is applied by the deblock filter unit.

[0022]

The reception unit can receive a merge flag indicating a same offset as an adjacent coding unit adjacent to a current coding unit, and the sample adaptive offset filter unit can use the merge flag received by the reception unit to apply sample adaptive offset filter to the image generated by the decoding unit.

[0023]

~~According to a second aspect of the present invention, there is provided an image processing method comprising: generating an image by performing decoding processing on a coded stream; and applying sample adaptive offset filter to the~~

~~generated image in accordance with the type information indicating a type which is common to a type of a sample adaptive offset filter of a first color difference component of an image and a type of a sample adaptive offset filter of a second color difference component of the image.~~

According to a second aspect of the present invention, there is provided an image processing method comprising: generating an image by performing decoding processing on a coded stream; and applying sample adaptive offset filter to the generated image in accordance with a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image.

[0023a]

According to a third aspect of the present invention, there is provided an image processing apparatus comprising: a syntax acquisition unit configured to obtain a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image; a decoding unit configured to perform decoding processing on the coded stream to generate a first image of the first color difference component and a second image of the second color difference component; and a sample adaptive offset filter unit configured to apply sample adaptive offset filter to the first image and the second image generated by the decoding unit, in accordance with the common parameter obtained by the syntax acquisition unit.

[0023b]

According to a fourth aspect of the present invention, there is provided an image processing method comprising: obtaining a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image; decoding the coded stream to generate a first image of the first color difference component and a second image of the second color difference component; and applying sample adaptive offset filter to the first image and the second image generated by the decoding unit, in accordance with the common parameter obtained by the syntax acquisition unit.

[0024]

In the first aspect of the present disclosure, the coded stream is decoded, and the image is generated. Then, the sample adaptive offset filter is applied to the generated image in accordance with the type of the sample adaptive offset filter which is common between the components of the image.

[0025]

It should be noted that the image processing apparatus explained above may be an independent apparatus, or may be an internal block constituting an image coding device or an image decoding device.

EFFECTS OF THE INVENTION

[0026]

According to the above aspects of the present disclosure, an image can be decoded. In particular, the amount of codes can be reduced.

BRIEF DESCRIPTION OF DRAWINGS
[0027]

Fig. 1 is a block diagram illustrating an example of main configuration of an image coding device.

Fig. 2 is a flowchart for explaining an example of flow of encoding processing.

Fig. 3 is a block diagram illustrating a main example of configuration of an image decoding device.

Claims

1. An image processing apparatus comprising:

a decoding unit configured to generate an image by performing decoding processing on a coded stream; and

a sample adaptive offset filter unit configured to apply sample adaptive offset filter to the image generated by the decoding unit in accordance with ~~type information indicating a type which is common to a type of a sample adaptive offset filter of a first color difference component of an image and a type of a sample adaptive offset filter of a second color difference component of the image~~ a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image.

~~2. The image processing apparatus according to claim 1, wherein information in which first type information indicating a type of a sample adaptive offset filter of a first color difference component of the image and second type information indicating a type of a sample adaptive offset filter of a second color difference component of the image are made common is set as the type information.~~

~~3~~2. The image processing apparatus according to claim ~~2~~1, wherein the ~~first type information~~ common parameter indicating the type of the sample adaptive offset filter of the first color difference component of the image and ~~the second type information indicating~~ the type of the sample adaptive offset filter of the second color difference component of the image ~~are made common and~~ is set for each maximum encoding unit.

~~4. The image processing apparatus according to claim 2, wherein the first type information indicating the type of the sample adaptive offset filter of the first color difference component of the image and the second type information indicating the type of the sample adaptive offset filter of the second color difference component of the image are made common as the type information.~~

~~5~~3. The image processing apparatus according to claim ~~4~~1, wherein the ~~first type information~~ common parameter indicating the type of the sample adaptive offset filter of the first color difference component of the image and ~~the second type information indicating~~ the type of the sample adaptive offset filter of the second color difference component of the image ~~are made common as~~ comprises a syntax of the coded stream.

~~6~~4. The image processing apparatus according to claim 1, wherein ~~information~~ the common parameter indicating ~~that~~ the type of the sample adaptive offset filter of the first color difference component of the image and the type of the sample adaptive offset filter of the second color difference component of the image ~~are common and~~ comprises band offsets ~~is set as the type information~~.

~~7~~5. The image processing apparatus according to claim 1, wherein ~~information~~ the common parameter indicating ~~that~~ the type of the sample adaptive offset filter of the first color difference component of the image and the type of the sample adaptive offset filter of the second color difference component of the image ~~are common and~~ comprises edge offsets ~~is set as the type information~~.

~~8~~6. The image processing apparatus according to claim ~~7~~1, wherein ~~information~~ the common parameter indicating ~~that~~ the type of the sample adaptive offset filter of the first color difference component of the image and the type of the sample adaptive offset filter of the second color difference component of the image ~~are common and~~ comprises pattern rules of edge offsets ~~is set as the type information~~.

~~9~~7. The image processing apparatus according to claim ~~8~~1, wherein ~~information~~ the common parameter indicating ~~that~~ the type of the sample adaptive offset filter of the first color difference component of the image and the type of the sample adaptive offset filter of the second color difference component of the image ~~are common and~~ comprises one-dimensional pattern rules of edge offsets ~~is set as the type information~~.

~~10~~8. The image processing apparatus according to claim ~~8~~1, wherein ~~information~~ the common parameter indicating ~~that~~ the type of the sample adaptive offset filter of the first color difference component of the image and the type of the sample adaptive offset filter of the second color difference component of the image ~~are common and~~ comprises two-dimensional pattern rules of edge offsets ~~is set as the type information~~.

~~11~~9. The image processing apparatus according to claim 1, wherein ~~information~~ the common parameter indicating ~~that~~ the type of the sample adaptive offset filter of the first color difference component of the image and the type of the sample adaptive offset filter of the second color difference component of the image ~~are common and~~ comprises types for not

applying offsets ~~is set as the type information~~.

~~12~~10. The image processing apparatus according to claim 1, wherein a color space of the image is in a Y/Cb/Cr format.

~~13~~11. The image processing apparatus according to claim 1, wherein the image is coded in a unit having a hierarchical structure.

~~14~~12. The image processing apparatus according to claim 1 further comprising a deblock filter unit configured to apply deblock filter to the image generated by the decoding unit, wherein the sample adaptive offset filter unit applies sample adaptive offset filter to the image to which the deblock filter is applied by the deblock filter unit.

~~15~~13. An image processing method comprising:

generating an image by performing decoding processing on a coded stream; and

applying sample adaptive offset filter to the generated image in accordance with ~~the type information indicating a type which is common to a type of a sample adaptive offset filter of a first color difference component of an image and a type of a sample adaptive offset filter of a second color difference component of the image~~ a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image.

14. An image processing apparatus comprising:

a syntax acquisition unit configured to obtain a common parameter of a type of sample adaptive offset filter for a

first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image;

a decoding unit configured to perform decoding processing on the coded stream to generate a first image of the first color difference component and a second image of the second color difference component; and

a sample adaptive offset filter unit configured to apply sample adaptive offset filter to the first image and the second image generated by the decoding unit, in accordance with the common parameter obtained by the syntax acquisition unit.

15. An image processing method comprising:

obtaining a common parameter of a type of sample adaptive offset filter for a first color difference component of an image and a type of sample adaptive offset filter for a second color difference component of the image;

decoding the coded stream to generate a first image of the first color difference component and a second image of the second color difference component; and

applying sample adaptive offset filter to the first image and the second image generated by the decoding unit, in accordance with the common parameter obtained by the syntax acquisition unit.