Kirchhoffer, Haricharan Lakshman, Detlev Marpe, Simon Oudin, Matthias Preiss, Heiko Schwarz, Mischa Siekmann, Karsten Suehring, and Thomas Wiegand, "Description of video coding technology proposed by Fraunhofer HHI," JCTVC-A116, April, 2010

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0013]

However, these techniques illustrate processes in the same view only and cannot perform inter-view vector prediction in the case of multi-view encoding. Thus, encoding efficiency may decrease.

[0014]

Embodiments of the present invention~~The present disclosure is made in view of the situations, and aims to~~ suppress a decrease in the encoding efficiency.

SOLUTIONS TO PROBLEMS

[0015]

According to a first aspect, there is provided an image processing device comprising: a predictive vector generating unit that generates a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector; and a difference vector generating unit that generates a difference vector between the current parallax vector and the predictive vector generated by the predictive vector generating unit,

wherein the predictive vector generating unit generates a predictive vector of the current parallax vector using a parallax vector of a co-located block included in a co-located picture of a time different from a current picture of the same view as a current view; and wherein the predictive vector generating unit sets the co-located block to be not available when a property of the vector of the current block is different from a property of the vector of the co-located block.

~~According to an aspect of the present disclosure, there is provided an image processing device including: a predictive vector generating unit that generates a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector; and a difference vector generating unit that generates a difference vector between the current parallax vector and the predictive vector generated by the predictive vector generating unit.~~

[0016]

~~The predictive vector generating unit may generate a predictive vector of the current parallax vector using a parallax vector of a co-located block included in a co-located picture of a time different from a current picture of the same view as a current view.~~

[0017]

~~The predictive vector generating unit may set the co-located block to be available when a property of a vector of the current block is identical to a property of a vector of the co-located block.~~

[0018]

The property of the vector is a type of a vector, and the predictive vector generating unit may set the co-located block to be available when the property of the vector of the current block is a parallax vector and the property of the vector of the co-located block is a parallax vector.

[0019]

The predictive motion vector generating unit may determine the property of the vector of the current block and the property of the vector of the co-located block using POC (Picture Order Count) that indicates an output order of pictures.

[0020]

The predictive motion vector generating unit may determine the property of the vector of the current block and the property of the vector of the co-located block using the POC of the current picture, the POC of a current reference picture referred from the current picture, the POC of the co-located picture, and the POC

of a co-located reference picture referred from the co-located picture.

[0021]

The predictive motion vector generating unit may determine that the property of the vector of the current block and the property of the vector of the co-located block are parallax vectors when the POC of the current picture is identical to the POC of the current reference picture referred from the current picture and the POC of the co-located picture is identical to the POC of the co-located reference picture referred from the co-located picture.

[0022]

The predictive vector generating unit may set the co-located block to be not available when the property of the vector of the current block is different from the property of the vector of the co-located block.

[0023]

According to a second aspect, there is provided an image processing device comprising: a predictive vector generating unit that generates a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector; and a difference vector generating unit that generates a difference vector between the current parallax vector and the predictive vector generated by the predictive vector generating unit, wherein the predictive vector generating unit generates a predictive vector of the current parallax vector using a

parallax vector of a co-located block included in a co-located picture of a time different from a current picture of the same view as a current view; and wherein the predictive vector generating unit sets the co-located block to be not available when a property of the vector of the current block is different from a property of the vector of the co-located block, wherein the property of the vector is a type of a reference picture, and the predictive vector generating unit sets the co-located block to be not available when the type of the reference picture of the current block is different from the type of the reference picture of the co-located block.

~~The property of the vector is a type of a reference picture, and the predictive vector generating unit may set the co-located block to be not available when the type of the reference picture of the current block is different from the type of the reference picture of the co-located block.~~

[0024]

The property of the vector is a type of a reference picture, and the predictive vector generating unit may skip a process of searching a reference index when the type of the reference picture of the current block is a long reference type and the type of the reference picture of the co-located block is a long reference type.

of a plurality of the neighboring blocks in which the value of a parallax vector in a Y-direction is not zero as the shift amount.

[0035]

The predictive vector generating unit may use an average value or a median value of the parallax vectors in the X-direction, of the plurality of the neighboring blocks in which the value of the parallax vector in the Y-direction is not zero as the shift amount of the image.

[0036]

The predictive vector generating unit may set the shift amount of the image according to a global parallax vector.

[0037]

According to a third aspect, there is provided an image processing method of an image processing device, for allowing the image processing device to execute the steps of: generating a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector; and generating a difference vector between the current parallax vector and the generated predictive vector, wherein the step of generating the predictive vector generates a predictive vector of the current parallax vector using a parallax vector of a co-located block included in a co-located picture of a time different from a current picture of the same view as a current view; and wherein the step of generating the predictive vector sets the co-located block to be not

available when a property of the vector of the current block is different from a property of the vector of the co-located block.

~~Further, according to an aspect of the present disclosure, there is provided an image processing method of an image processing device, for allowing the image processing device to execute: generating a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector, and generating a difference vector between the current parallax vector and the generated predictive vector.~~

[0038]

Disclosed herein is~~According to another aspect of the present disclosure, there is provided~~ an image processing device including: a predictive vector generating unit that generates a predictive vector of a current parallax vector of a current block used in prediction using

correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when decoding the current parallax vector; and an arithmetic unit that performs an operation of adding the predictive vector generated by the predictive vector generating unit to a difference vector between the current parallax vector and the predictive vector to reconstruct the current parallax vector.

[0039]

Disclosed herein is~~Further, according to another aspect of the present disclosure, there is provided~~ an image processing method of an image processing device, for allowing the image processing device to execute: generating a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference parallax vector referred when generating a predictive motion vector, when decoding the current parallax vector; and performing an operation of adding the generated predictive vector to a difference vector between the current parallax vector and the predictive vector to reconstruct the current parallax vector.

[0040]

Disclosed herein is~~According to still another aspect of the present disclosure, there is provided~~ an image processing device including: a predictive vector generating unit that sets a co-located block to be not available when a type of a reference picture of a current block is different from a type of the reference picture of a co-located block included in a co-located picture of a different time from a current picture when encoding a current motion vector

of the current block used in prediction using correlation in a temporal direction and generates a predictive vector of the current motion vector using a reference motion vector referred when generating a predictive motion vector; and a difference vector generating unit that generates a difference vector between the current motion vector and the predictive vector generated by the predictive vector generating unit.

[0041]

Disclosed herein is~~Further, according to still another aspect of the present disclosure, there is provided~~ an image processing method of an image processing device, for allowing the image processing device to execute: setting a co-located block to be not available when a type of a reference picture of a current block is different from a type of the reference picture of a co-located block included in a co-located picture of a different time from a current picture when encoding a current motion vector of the current block used in prediction using correlation in a temporal direction, and generating a predictive vector of the current motion vector using a reference motion vector referred when generating a predictive motion vector; and generating a difference vector between the current motion vector and the generated predictive vector.

[0041a]

According to a fourth aspect, there is provided an image processing method comprising the steps of: generating a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction using a reference

parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector; and generating a difference vector between the current parallax vector and the predictive vector generated by the predictive vector generating step, wherein the step of generating the predictive vector generates a predictive vector of the current parallax vector using a parallax vector of a co-located block included in a co-located picture of a time different from a current picture of the same view as a current view; and wherein the step of generating the predictive vector sets the co-located block to be not available when a property of the vector of the current block is different from a property of the vector of the co-located block, wherein the property of the vector is a type of a reference picture, and the step of generating the predictive vector sets the co-located block to be not available when the type of the reference picture of the current block is different from the type of the reference picture of the co-located block.

[0042]

In one ~~aspect~~embodiment of the present disclosure, a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction is generated using a reference parallax vector referred when generating a predictive motion vector, when encoding the current parallax vector;

and a difference vector between the current parallax vector and the generated predictive vector is generated.

[0043]

According to another ~~aspect~~embodiment of the present disclosure, a predictive vector of a current parallax vector of a current block used in prediction using correlation in a parallax direction is generated using a reference parallax vector referred when generating a predictive motion vector, when decoding the current parallax vector; and an operation of adding the generated predictive vector to a difference vector between the current parallax vector and the predictive vector to reconstruct the current parallax vector is performed.

[0044]

According to a still another ~~aspect~~embodiment of the present disclosure, a co-located block is set to be not available when a type of a reference picture of a current block is different from a type of the reference picture of a co-located block included in a co-located picture of a different time from a current picture when encoding a current motion vector of the current block used in prediction using correlation in a temporal direction; a predictive vector of the current motion vector is generated using a reference motion vector referred when generating a predictive motion vector; and a difference vector between the current motion vector and the generated predictive vector is generated.

EFFECTS OF THE INVENTION

[0045]

According to embodiments of the present invention~~the present disclosure~~, it is possible