CLAIMS

[1] A moving image encoding device comprising:

a block dividing unit for dividing an inputted image which consists of a luminance signal and color difference signals into blocks each of which is a prediction unit to output a target block to be encoded which is a prediction unit;

an encoding control unit for determining an intra prediction parameter which is used when carrying out an intra prediction process on the target block to be encoded outputted from said block dividing unit;

a prediction image generating unit for carrying out an intra prediction process on the target block to be encoded outputted from said block dividing unit by using the intra prediction parameter determined by said encoding control unit to generate a prediction image of the luminance signal and a prediction image of the color difference signal;

a quantizing unit for quantizing a difference image between the prediction image generated by said prediction image generating unit and the target block to be encoded outputted from said block dividing unit to output quantization coefficients of said difference image; and

a variable length encoding unit for variable-length-encoding both the quantization coefficients outputted from said quantizing unit and the intra prediction parameter determined by said encoding control unit to generate a bitstream,

wherein when generating the prediction image of the color difference signal, said prediction image generating unit carries out the intra prediction process on the target block to be encoded of the color difference signal by using an intra

prediction parameter which is same as an intra prediction parameter which said prediction image generating unit uses when carrying out the intra prediction process on the target block to be encoded of the luminance signal, or carries out the intra prediction process on the target block to be encoded of the color difference signal by applying an average prediction to the target block to be encoded, and said variable length encoding unit variable-length-encodes a flag showing whether said prediction image generating unit carries out the intra prediction process on the target block to be encoded of the color difference signal by using the same intra prediction parameter as that used for the luminance signal as the intra prediction parameter which said prediction image generating unit uses when carrying out the intra prediction process on the target block to be encoded of the color difference signal.

[2] The moving image encoding device according to claim 1, wherein after carrying out the intra prediction process on the target block to be encoded of the color difference signal to generate the prediction image of the color difference signal, the prediction image generating unit carries out smoothing filtering on said prediction image.

[3] A moving image decoding device comprising:

a variable length decoding unit for variable-length-decoding quantization coefficients and an intra prediction parameter from a bitstream;

an inverse quantizing unit for inverse-quantizing the quantization coefficients variable-length-decoded by said variable length decoding unit;

a prediction image generating unit for carrying out an intra prediction process on a target block to be decoded by using

the intra prediction parameter variable-length-decoded by said variable length decoding unit to generate a prediction image of a luminance signal and prediction images of color difference signals; and

an image adding unit for adding the prediction image generated by said prediction image generating unit and a difference image shown by a result of the inverse quantization carried out by said inverse quantizing unit to acquire a decoded image,

wherein said variable length decoding unit variable-length-decodes a flag from said bitstream, and, when the flag variable-length-decoded by said variable length decoding unit shows that an intra prediction process is carried out on a target block to be encoded of the color difference signal by using an intra prediction parameter which is same as that used for the luminance signal, said prediction image generating unit carries out the intra prediction process on the target block to be decoded of the color difference signal by using the same intra prediction parameter as that used for the luminance signal to generate the prediction image of the color difference signal, and, when said flag shows that the intra prediction process is not carried out on the target block to be encoded of the color difference signal by using the intra prediction parameter which is the same as that used for the luminance signal, said prediction image generating unit carries out the intra prediction process on the target block to be decoded of the color difference signal to generate the prediction image of the color difference signal by applying an average prediction to the target block to be decoded.

~~[4] The moving image decoding device according to claim 3,~~

wherein after carrying out the intra prediction process on the target block to be decoded of the color difference signal to generate the prediction image of the color difference signal, the prediction image generating unit carries out smoothing filtering on said prediction image.

[5] A moving image encoding method comprising:

a block division processing step of a block dividing unit dividing an inputted image which consists of a luminance signal and color difference signals into blocks each of which is a prediction unit to output a target block to be encoded which is a prediction unit;

an encoding control processing step of an encoding control unit determining an intra prediction parameter which is used when carrying out an intra prediction process on the target block to be encoded outputted in said block division processing step;

a prediction image generation processing step of a prediction image generating unit carrying out an intra prediction process on the target block to be encoded outputted in said block division processing step by using the intra prediction parameter determined in said encoding control processing step to generate a prediction image of a luminance signal and a prediction image of a color difference signal;

a quantization processing step of a quantization unit quantizing a difference image between the prediction image generated in said prediction image generation processing step and the target block to be encoded outputted in said block division processing step to output quantization coefficients of said difference image; and

a variable length encoding processing step of a variable

length encoding unit variable-length-encoding both the quantization coefficients outputted in said quantization processing step and the intra prediction parameter determined in said encoding control processing step to generate a bitstream,

wherein when generating the prediction image of the color difference signal, said prediction image generating unit carries out the intra prediction process on the target block to be encoded of the color difference signal by using an intra prediction parameter which is same as an intra prediction parameter which said prediction image generating unit uses when carrying out the intra prediction process on the target block to be encoded of the luminance signal, or carries out the intra prediction process on the target block to be encoded of the color difference signal by applying an average prediction to the target block to be encoded, and said variable length encoding unit variable-length-encodes a flag showing whether said prediction image generating unit carries out the intra prediction process on the target block to be encoded of the color difference signal by using the same intra prediction parameter as that used for the luminance signal as the intra prediction parameter which said prediction image generating unit uses when carrying out the intra prediction process on the target block to be encoded of the color difference signal.

[6] A moving image decoding method comprising:

a variable length decoding processing step of a variable length decoding unit variable-length-decoding quantization coefficients and an intra prediction parameter from a bitstream;

an inverse quantization processing step of an inverse

quantizing unit inverse-quantizing the quantization coefficients variable-length-decoded in said variable length decoding processing step;

a prediction image generation processing step of a prediction image generating unit carrying out an intra prediction process on a target block to be decoded by using the intra prediction parameter variable-length-decoded in said variable length decoding processing step to generate a prediction image of a luminance signal and prediction images of color difference signals; and

an image addition processing step of an image adding unit adding the prediction image generated in said prediction image generation processing step and a difference image shown by a result of the inverse quantization carried out in said inverse quantization processing step to acquire a decoded image,

wherein said variable length decoding unit variable-length-decodes a flag from said bitstream, and, when the flag variable-length-decoded by said variable length decoding unit shows that an intra prediction process is carried out on a target block to be encoded of the color difference signal by using an intra prediction parameter which is same as that used for the luminance signal, said prediction image generating unit carries out the intra prediction process on the target block to be decoded of the color difference signal by using the same intra prediction parameter as that used for the luminance signal to generate the prediction image of the color difference signal, and, when said flag shows that the intra prediction process is not carried out on the target block to be encoded of the color difference signal by using the intra prediction parameter which is the same as that used for the luminance signal,

said prediction image generating unit carries out the intra prediction process on the target block to be decoded of the color difference signal to generate the prediction image of the color difference signal by applying an average prediction to the target block to be decoded.

CLAIMS

[1] A moving image decoding device comprising:

a variable length decoding unit for variable-length-decoding quantization coefficients and an intra prediction parameter from a bitstream;

an inverse quantizing unit for inverse-quantizing the quantization coefficients variable-length-decoded by the variable length decoding unit;

a prediction image generating unit for carrying out an intra prediction process on a target block to be decoded by using the intra prediction parameter to generate a prediction image which comprises a luminance signal and a color difference signal; and

an image adding unit for adding the prediction image and a difference image obtained by inverse transforming a result of the inverse quantization to acquire a decoded image,

characterized in that

the variable length decoding unit variable-length-decodes information from the bitstream,

the information indicates the intra prediction process of the color difference signal on the target block, and indicates as a single piece of information indicating the intra prediction process using the intra prediction parameter which is same as that used for the luminance signal of the target block or using an average prediction,

the prediction image generating unit carries out the intra prediction process of the color difference signal on the target block corresponding to the information to generate the prediction image of the color difference signal.

[2] A moving image decoding method comprising:

a variable length decoding processing step for variable-length-decoding quantization coefficients and an intra prediction parameter from a bitstream;

an inverse quantization processing step for inverse-quantizing the quantization coefficients variable-length-decoded in the variable length decoding processing step;

a prediction image generation processing step for carrying out an intra

prediction process on a target block to be decoded by using the intra prediction parameter to generate a prediction image which comprises a luminance signal and a color difference signal; and

an image addition processing step for adding the prediction image and a difference image obtained by inverse transforming a result of the inverse quantization to acquire a decoded image,

characterized in that

the variable length decoding processing step variable-length-decodes information from the bitstream,

the information indicates the intra prediction process of the color difference signal on the target block, and indicates as a single piece of information indicating the intra prediction process using the intra prediction parameter which is same as that used for the luminance signal of the target block or using an average prediction,

the prediction image generating processing step carries out the intra prediction process of the color difference signal on the target block corresponding to the information to generate the prediction image of the color difference signal.