CLAIMS

[1] A moving image decoding device comprising:

a variable length decoding unit for receiving a bitstream compression-encoded in unit of a macroblock having a predetermined size into which an image is divided, for decoding information about the size of the macroblock specified for a sequence, and an encoding mode in unit of the macroblock corresponding to the size information, and for decoding prediction parameters corresponding to the encoding mode, information indicating a transformation block size selected from a plurality of candidates whose maximum size is the size of the macroblock specified for the sequence, and compression data;

an intra-prediction unit for, when the prediction parameters are inputted, generating a prediction image by using an intra prediction mode, which is included in the prediction parameters, and a decoded image signal in a frame;

a transformation unit for carrying out an inverse quantization and inverse transformation process on the compressed data to generate a decoded prediction difference signal; and

an adding unit for adding the prediction image outputted from the the intra-prediction unit to the decoded prediction difference signal to output a decoded image signal,

wherein the transformation unit determines a transformation block size on a basis of the decoded information indicating the transformation block size, and carries out an inverse quantization and inverse transformation process on the compressed data in unit of one block having the transformation block size.

CLAIMS

[1] A moving image encoding device comprising:

a block dividing unit for dividing an inputted image into macroblock images of two or more blocks each having a predetermined size and dividing each of the macroblock images into a block image of one or more blocks in accordance with an encoding mode to output the block image;

an intra-prediction unit for, when said block image is inputted thereto, carrying out an intra-frame prediction on said block image by using an image signal in a frame to generate a prediction image;

a motion-compensated prediction unit for, when said block image is inputted thereto, carrying out an image motion-compensated prediction on said block by using one or more frames of reference images to generate a prediction image;

a transformation/quantization unit for carrying out a transformation and quantization process on a prediction difference signal which is generated by subtracting the prediction image outputted from either one of said intra-prediction unit and said motion-compensated prediction unit from said block image outputted from said block dividing unit to generate compressed data;

a variable length encoding unit for entropy-encoding said compressed data to multiplex said compressed data entropy-encoded thereby into a bitstream; and

an encoding controlling unit for selecting a certain transformation block size from a set of transformation block sizes predetermined in accordance with a block size of said block image to notify said transformation block

size selected thereby to said transformation/quantization unit, wherein

said transformation/quantization unit divides said prediction difference signal into blocks each having said transformation block size notified thereto from said encoding controlling unit, and carries out a transformation and quantization process on each of the blocks to generate compressed data.

[2] The moving image encoding device according to claim 1, wherein said encoding controlling unit notifies a certain transformation block size among a set of transformation block sizes fixed for each encoding mode of said block image to said transformation/quantization unit, and said variable length encoding unit entropy-encodes information indicating said transformation block size, and multiplexes said information into the bitstream.

[3] The moving image encoding device according to claim 2, wherein said moving image encoding device includes a switching unit for inputting said block image outputted from said block dividing unit to either one of said intra-prediction unit and said motion-compensated prediction unit according to an encoding mode of said block image, and a subtraction unit for subtracting the prediction image outputted from either one of said intra-prediction unit and said motion-compensated prediction unit from said block image outputted from said block dividing unit to generate the prediction difference signal.

[4] The moving image encoding device according to claim 2, wherein said encoding controlling unit notifies said transformation/quantization unit of each of one or more

transformation block sizes included in the set of transformation block sizes, acquires compressed data associated with said each of one or more transformation block sizes to evaluate a degree of encoding efficiency, and selects one transformation block size from said set of transformation block sizes on a basis of results of the evaluation, said transformation/quantization unit divides the prediction difference signal into blocks for each of cases in which said blocks have a size equal to each of the one or more transformation block sizes, which are included in the set of transformation block sizes notified thereto from said encoding controlling unit, and for a case in which said blocks have said transformation block size selected from said set, and carries out a transformation and quantization process on each of the blocks to generate compressed data in each of said cases, and said variable length encoding unit entropy-encodes information specifying said transformation block size selected from said set and the compressed data associated with said selected transformation block size in units of one block of the block image to multiplex said information and said compressed data entropy-encoded thereby into the bitstream.

[5] A moving image decoding device comprising:

a variable length decoding unit for receiving a bitstream inputted thereto and compression-encoded in units of each of macroblocks having a predetermined size into which an image is divided and then entropy-decoding an encoding mode in units of one of said macroblocks from said bitstream, and for entropy-decoding prediction parameters, information indicating a transformation block size, and

compressed data in units of one of the macroblocks into which the image is divided in accordance with said decoded encoding mode;

an intra-prediction unit for, when said prediction parameters are inputted thereto, generating a prediction image by using an intra prediction mode and a decoded image signal in a frame which are included in the prediction parameters;

a motion-compensated prediction unit for, when said prediction parameters are inputted thereto, carrying out a motion-compensated prediction by using a motion vector included in the prediction parameters and a reference image specified by a reference image index included in the prediction parameters to generate a prediction image;

an inverse quantization/inverse transformation unit for carrying out an inverse quantization and inverse transformation process on said compressed data by using said information indicating the transformation block size to generate a decoded prediction difference signal; and

an adding unit for adding the prediction image outputted from either one of the said intra-prediction unit and said motion-compensated prediction unit to said decoded prediction difference signal to output a decoded image signal, wherein

said inverse quantization/inverse transformation unit determines a transformation block size on a basis of said decoded information indicating the transformation block size, and carries out an inverse quantization and inverse transformation process on said compressed data in units of one block having said transformation block size.

[6] The moving image decoding device according to claim 5, wherein said information indicating the transformation block size is identification information for identifying the transformation block size among a set of transformation block sizes fixed for each encoding mode of said block image.

[7] The moving image decoding device according to claim 6, wherein said moving image decoding device includes a switching unit for inputting the prediction parameters decoded by said variable length decoding unit to either one of said intra-prediction unit and said motion-compensated prediction unit according to said decoded encoding mode.