Claims

1. An image decoding device which decodes a predictive-encoded bit stream to acquire a moving image signal, the bit stream being generated by dividing a frame of the moving image signal into reference blocks and by performing a motion prediction for the reference block, the image decoding device comprising:

an arithmetic decoder to change an occurrence probability depending on dividing an adjacent block of the reference block for decoding the bit stream;

a decoder to decode the bit stream to acquire information indicating size of the reference block, information indicating a threshold on a block size which corresponds to a minimum size of a motion prediction unit block, a motion vector, and a motion prediction mode,

wherein the decoder

acquires a first motion prediction mode which is the motion prediction mode for a first motion prediction unit block corresponding to the reference block and determines whether or not the first motion prediction mode is a skip mode, and

acquires a second motion prediction mode which is the motion prediction mode for a second motion prediction unit block and determines whether or not the second motion prediction mode is a skip mode when the first motion prediction mode is not a skip mode and the size of the reference block is larger than the threshold, the second motion prediction unit block being obtained by dividing the reference block hierarchically;

a predictor

to determine an estimated vector from an adjacent motion vector and set the estimated vector as a motion vector for the first motion prediction unit block to create a prediction image when the first motion prediction mode is a skip mode, and

to determine an estimated vector from an adjacent motion vector and set the estimated vector as a motion vector for the second motion prediction unit block to create a prediction image when the first motion prediction mode is not a skip mode and the second motion prediction mode is a skip mode, and

to create a prediction image based on the second motion prediction mode and the motion vector decoded by the decoder when the first motion prediction mode is not a skip mode and the second motion prediction mode is not a skip mode; and

an adder to add a prediction error signal set to zero and the prediction image when the first motion prediction mode or the second motion prediction mode is a skip mode.

2. An image decoding method of decoding a predictive-encoded bit stream to acquire a moving image signal, the bit stream being generated by dividing a frame of the moving image signal into reference blocks and by performing a motion prediction for the reference block, the image decoding method comprising:

changing an occurrence probability depending on dividing an adjacent block of the reference block for decoding the bit stream;

decoding the bit stream to acquire information indicating a size of the reference block, information indicating a threshold on a block size which corresponds to a minimum size of a motion prediction unit block, a motion vector, and a motion prediction mode,

wherein the decoding

acquires a first motion prediction mode which is the motion prediction mode for a first motion prediction unit block corresponding to the reference block and determines whether or not the first motion prediction mode is a skip mode, and

acquires a second motion prediction mode which is the motion prediction mode for a second motion prediction unit block and determines whether or not the second motion prediction mode is a skip mode when the first motion prediction mode is not a skip mode and the size of the reference block is larger than the threshold, the second motion prediction unit block being obtained by dividing the reference block hierarchically;

creating a prediction image by determining an estimated vector from an adjacent motion vector and by setting the estimated vector as a motion vector for the first motion prediction unit block when the first motion prediction mode is a skip mode,

creating a prediction image by determining an estimated vector from an adjacent motion vector and by setting the estimated vector as a motion vector for the second motion prediction unit block when the first motion prediction mode is not a skip mode and the second motion prediction mode is a skip mode,

creating a prediction image based on the second motion prediction mode and the motion vector decoded by the decoding step when the first motion prediction mode is not a skip mode and the second motion prediction mode is not a skip mode; and

adding a prediction error signal set to zero and the prediction image when the first motion prediction mode or the second motion prediction mode is a skip mode.

3. An image encoding device which generates a predictive-encoded bit stream by dividing a frame of a moving image signal into reference blocks and by performing a motion prediction for the reference block, the image encoding device comprising:

an arithmetic encoder to change an occurrence probability depending on dividing an adjacent block of the reference block for encoding into the bit stream;

an encoder to encode, into the bit stream information indicating a size of the reference block, information indicating a threshold on a block size which corresponds to a minimum size of a motion prediction unit block, a motion vector, and a motion prediction mode,

wherein the encoder

encodes a first motion prediction mode which is the motion prediction mode for a first motion prediction unit block corresponding to the reference block, and

encodes a second motion prediction mode which is the motion prediction mode for a second motion prediction unit block when the first motion prediction mode is not a skip mode and the size of the reference block is larger than the threshold, the second motion prediction unit block being obtained by dividing the reference block hierarchically;

a predictor

to create a prediction image by determining an estimated vector from an adjacent motion vector and by setting the estimated vector as a motion vector for the first motion prediction unit block when the first motion prediction mode is a skip mode,

to create a prediction image by determining an estimated vector from an adjacent motion vector and by setting the estimated vector as a motion vector for the second motion prediction unit block when the first motion prediction mode is not a skip mode and the second motion prediction mode is a skip mode, and

to create a prediction image based on the second motion prediction mode and the motion vector encoded by the encoder when the first motion prediction mode is not a skip mode and the second motion prediction mode is not a skip mode; and

an adder to add a prediction error signal set to zero and the prediction image when the first motion prediction mode or the second motion prediction mode is a skip mode.

4. An image encoding method of generating a predictive-encoded bit stream by dividing a frame of the moving image signal into reference blocks and by performing a motion prediction for the reference block, the image encoding method comprising:

changing an occurrence probability depending on dividing an adjacent block of the reference block for encoding into the bit stream;

encoding, into the bit stream,

information indicating a size of the reference block,

information indicating a threshold on a block size which corresponds to a minimum size of a motion prediction unit block,

a motion vector, and

a motion prediction mode,

wherein the encoding step

encodes a first motion prediction mode which is the motion prediction mode for a first motion prediction unit block corresponding to the reference block, and

encodes a second motion prediction mode which is the motion prediction mode for a second motion prediction unit block when the first motion prediction mode is not a skip mode and the size of the reference block is larger than the threshold, the second motion prediction unit block being obtained by dividing the reference block hierarchically;

creating a prediction image by determining an estimated vector from an adjacent motion vector vectors and by setting the estimated vector as a motion vector for the first motion prediction unit block when the first motion prediction mode is a skip mode,

creating a prediction image by determining an estimated vector from an adjacent motion vector and by setting the estimated vector as a motion vector for the second motion prediction unit block when the first motion prediction mode is not a skip mode and the second motion prediction mode is a skip mode, and

creating a prediction image based on the second motion prediction mode and the motion vector encoded by the encoding step when the first motion prediction mode is not a skip mode and the second motion prediction mode is not a skip mode; and

adding a prediction error signal set to zero and the prediction image when the first motion prediction mode or the second motion prediction mode is a skip mode.

5. A non-transitory recording medium which includes a predictive-encoded bit stream decoded by an image decoding device,

the bit stream

being generated by dividing a frame of the moving image signal into reference blocks and by performing a motion prediction for the reference block, and

including

information indicating a size of the reference block,

information indicating a threshold on a block size which corresponds to a minimum size of a motion prediction unit block,

a motion vector, and

a motion prediction mode,

wherein the bit stream includes

a first motion prediction mode which is the motion prediction mode for a first motion prediction unit block corresponding to the reference block, and

a second motion prediction mode which is the motion prediction mode for a second motion prediction unit block obtained by dividing the reference block hierarchically when the first motion prediction mode is not a skip mode and the size of the reference block is larger than the threshold, and

wherein the image decoding device

creates a prediction image by determining an estimated vector from an adjacent motion vector and by setting the estimated vector as a motion vector for the first motion prediction unit block when the first motion prediction mode is a skip mode,

creates a prediction image by determining an estimated vector from an adjacent motion vector and setting the estimated vector as a motion vector for the second motion prediction unit block when the first motion prediction mode is not a skip mode and the second motion prediction mode is a skip mode,

creates a prediction image based on the second motion prediction mode and the motion vector included in the bit stream when the first motion prediction mode is not a skip mode and the second motion prediction mode is not a skip mode, and

changes an occurrence probability depending on dividing an adjacent block of the reference block for decoding the bit stream, on a basis of the bit stream.