

CLAIMS

[1] An image decoding device comprising:

an intra prediction unit for, when a coding mode for a coding block is an intra coding mode, carrying out an intra-frame prediction process on each of processing blocks to generate a prediction image, each of the processing blocks being the coding block or a sub-block obtained by dividing the coding block,

wherein, when an intra prediction parameter indicates a horizontal prediction process and a size of the processing block is less than a predetermined size,

the intra prediction unit adds, at each row within a predetermined number of a row or rows locating from an upper end of the processing block, a value to a signal value of a pixel adjacent to left of the processing block and sets a result of the addition as a predicted value of the prediction image, the value being proportional to an amount of change in a horizontal direction of signal values of pixels adjacent to top of the processing block, and

sets, at remaining rows of the processing block, a signal value of a pixel adjacent to left of the processing block as a predicted value of the prediction image, and

when the intra prediction parameter indicates the horizontal prediction process and the size of the processing block is greater than or equal to the predetermined size,

the intra prediction unit sets the signal value of the pixel adjacent to left of the processing block as a predicted value of the prediction image.

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[2] An image encoding device comprising:

an intra prediction unit for, when a coding mode for a coding block is an intra coding mode, carrying out an intra-frame prediction process on each of processing blocks to generate a prediction image, each of the processing blocks being the coding block or a sub-block obtained by dividing the coding block,

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wherein, when an intra prediction parameter indicates a horizontal prediction process and a size of the processing block is less than a predetermined size,

the intra prediction unit adds, at each row within a predetermined number of a row or rows locating from an upper end of the processing block, a value to a signal value of a pixel adjacent to left of the processing block and sets a result of the addition as a predicted value of

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the prediction image, the value being proportional to an amount of change in a horizontal direction of signal values of pixels adjacent to top of the processing block, and

sets, at remaining rows of the processing block, a signal value of a pixel adjacent to left of the processing block as a predicted value of the prediction image, and

5 when the intra prediction parameter indicates the horizontal prediction process and the size of the processing block is greater than or equal to the predetermined size,

the intra prediction unit sets the signal value of the pixel adjacent to left of the processing block as the predicted value of a prediction image.

10 [3] A data structure of encoded data encoded by carrying out a prediction process on each of processing blocks, each of the processing blocks being a coding block or a sub-block obtained by dividing the coding block,

wherein the encoded data comprises a coding mode for the coding block,

an intra prediction parameter indicating an intra prediction mode and used for carrying
15 out an intra-frame prediction process on each of the processing blocks when the coding mode is an intra coding mode,

information defining a block size of each of the processing blocks, and

compressed data generated by carrying out a compression process on a difference
between an image of each of the processing blocks and each of prediction images generated by
20 carrying out a prediction process on each of the processing blocks,

wherein, in case that the coding mode is an intra coding mode and the intra prediction parameter indicates a horizontal prediction process,

when the block size is less than a predetermined size, the prediction image comprises,
at each row within a predetermined number of a row or rows locating from an upper end of the
25 processing block, a predicted value of the prediction image which is obtained by adding a value to a signal value of a pixel adjacent to left of the processing block, the value being proportional to an amount of change in a horizontal direction of signal values of pixels adjacent to top of the processing block, and

at remaining rows of the processing block, a predicted value of the prediction image
30 which is set to a signal value of a pixel adjacent to left of the processing block, and

when the block size is greater than or equal to the predetermined size, the prediction image comprises a predicted value of the prediction image which is set to the signal value of the pixel adjacent to left of the processing block.

- 5 [4] An image decoding method comprising an intra prediction processing step performed by an intra prediction unit, the intra prediction processing step including processes of,
- when a coding mode for a coding block is an intra coding mode, carrying out an intra-frame prediction process on each of processing blocks to generate a prediction image, each of the processing blocks being the coding block or a sub-block obtained by dividing the coding
- 10 block,
- when an intra prediction parameter indicates a horizontal prediction process and a size of the processing block is less than a predetermined size,
- adding, at each row within a predetermined number of a row or rows locating from an upper end of the processing block, a value to a signal value of a pixel adjacent to left of the
- 15 processing block and setting a result of the addition as a predicted value of the prediction image, the value being proportional to an amount of change in a horizontal direction of signal values of pixels adjacent to top of the processing block, and
- setting, at remaining rows of the processing block, a signal value of a pixel adjacent to left of the processing block as a predicted value of the prediction image, and
- 20 when the intra prediction parameter indicates the horizontal prediction process and the size of the processing block is greater than or equal to the predetermined size,
- setting the signal value of the pixel adjacent to left of the processing block as a predicted value of the prediction image.

- 25 [5] An image encoding method comprising an intra prediction processing step performed by an intra prediction unit, the intra prediction processing step including processes of,
- when a coding mode for a coding block is an intra coding mode, carrying out an intra-frame prediction process on each of processing blocks to generate a prediction image, each of the processing blocks being the coding block or a sub-block obtained by dividing the coding
- 30 block,

when an intra prediction parameter indicates a horizontal prediction process and a size of the processing block is less than a predetermined size,

adding, at each row within a predetermined number of a row or rows locating from an upper end of the processing block, a value to a signal value of a pixel adjacent to left of the processing block and setting a result of the addition as a predicted value of the prediction image, the value being proportional to an amount of change in a horizontal direction of signal values of pixels adjacent to top of the processing block, and

setting, at remaining rows of the processing block, a signal value of a pixel adjacent to left of the processing block as a predicted value of the prediction image, and

when the intra prediction parameter indicates the horizontal prediction process and the size of the processing block is greater than or equal to the predetermined size,

setting the signal value of the pixel adjacent to left of the processing block as the predicted value of a prediction image.