CLAIMS

Claim 1.

A video coding device comprising:

a coding control unit for selecting a coding mode for each of coding blocks obtained by hierarchically dividing from coding block having a maximum size which is a processing unit of a coding process;

an intra prediction unit for performing intra prediction on each partition of said coding blocks to generate an intra prediction image according to said coding mode when said coding mode indicates intra prediction mode;

a motion-compensated prediction unit for performing inter prediction on each partition of said coding blocks to generate an inter prediction image according to said coding mode when said coding mode indicates inter prediction mode;

a transforming unit for transforming a difference image between an input image and the intra prediction image or the inter prediction image in units of a block having a transformation block size included in a prediction difference encoding parameters to generate a compressed data of the difference image; and

a variable length coding unit for performing a variable length coding on said coding mode for said coding block, said prediction difference encoding parameters, an intra prediction parameter used for generating a prediction image by performing said intra prediction on a partition of said coding block, and said compressed data to generate a coded data,

wherein said variable length coding unit performing a variable length coding on an intra merge flag indicating whether or not said intra prediction parameter to be used for said partition is identical to an intra prediction parameter used for a neighboring partition adjacent to top or left of said partition,

wherein when there are two or more neighboring partitions adjacent to top or left of said partition on which said intra prediction is performed, a first partition in a direction away from a top left of said partition is selected as each of said neighboring partitions adjacent to the top and the left of said partition,

wherein when said intra prediction parameter to be used for said partition is identical to said intra prediction parameter used for said neighboring partition adjacent to top or left of said partition, said variable length coding unit performs a variable length coding on an intra merge direction which specifies one of neighboring partitions adjacent to top and to the left of said partition of which intra prediction parameter is identical to said intra prediction parameter, and

when said intra prediction parameter to be used for said partition is not identical to said intra prediction parameter to be used for said neighboring partition adjacent to top or

to the left of said partition, said variable length coding unit performs a variable length coding on said intra prediction parameter used for said partition.

Claim 2.

A video decoding device comprising:

a variable length decoding unit for performing a variable length decoding on coded data associated with a coding block divided up to an upper limit on the number of hierarchical layers to obtain compressed data, prediction difference encoding parameters and a coding mode for each of said coding blocks;

an intra prediction unit for performing intra prediction on each partition of said coding blocks to generate an intra prediction image according to said coding mode when said coding mode indicates intra prediction mode;

a motion-compensated prediction unit for performing inter prediction on each partition of said coding blocks to generate an inter prediction image according to said coding mode when said coding mode indicates inter prediction mode;

an inverse transforming unit for outputting a prediction difference signal by performing an inverse transformation process on the compressed data in units of a block having a transformation block size included in the prediction difference encoding parameters; and

a decoded image generating unit for carrying out a process of adding the prediction difference signal generated from the compressed data and the intra prediction image generated by the intra prediction unit or the inter prediction image generated by the motion compensation unit to generate a decoded image,

wherein when there are two or more neighboring partitions adjacent to top or left of said partition of said coding block on which said intra prediction is performed, a first partition in a direction away from a top left of said partition is regarded as each of neighboring partitions located above and to the left of said partition,

wherein said variable length decoding unit decoding an intra merge flag indicating whether or not an intra prediction parameter for a partition is identical to an intra prediction parameter for a neighboring partition adjacent to top or left of said partition,

wherein when said intra prediction parameter for said partition is identical to said intra prediction parameter for said neighboring partition adjacent to top or left of said partition, said variable length decoding unit decodes an intra merge direction specifying one of neighboring partitions adjacent to the top and the left of said partition of which intra prediction parameter is identical to said intra prediction parameter, and

when said intra prediction parameter for said partition

is not identical to said intra prediction parameter for said neighboring partition adjacent to top or left of said partition, said variable length decoding unit decodes said intra prediction parameter for said partition.

Claim 3.

A coded video data comprising coded data having a coding mode for each of coding blocks divided up to an upper limit on the number of hierarchical layers;

the coded video data into which coded data of the plurality of the coding blocks, the maximum size of the coding block, and the number of the hierarchical layers of the coding block are multiplexed; and

the coded data comprising the coding mode of the coding block and including coded data associated with partitions of the coding block,

the coded data including:

an intra merge flag indicating whether or not an intra prediction parameter used to perform intra prediction on a partition of said coding block is identical to an intra prediction parameter used to perform intra prediction on a neighboring partition adjacent to top or left of said partition,

an intra merge direction specifying one of neighboring partitions adjacent to top and left of said partition of which intra prediction parameter is identical to said intra prediction parameter used to perform intra prediction on said partition when said intra prediction parameter used to perform intra prediction on said partition is identical to said intra prediction parameter used to perform intra prediction on a neighboring partition adjacent to top or left of said partition, and

an intra prediction parameter of the partition when the intra merge flag indicates that the intra prediction parameter used for performing intra prediction on the partition is not identical to the intra prediction parameter used for performing intra prediction on a partition adjacent to a top or a left of the partition,

compressed data of a difference image between the prediction image generated by the prediction process according to the coding mode and an input image,

prediction difference encoding parameters including a quantization parameter used by an inverse transformation process on the compressed data and a transformation block size,

wherein a video decoding device for decoding the coded video data generates a prediction difference signal by performing the inverse transformation process on the compressed data and an inverse transformation process in units of a block having a transformation block size,

said video decoding device decodes the intra merge flag for said partition of said coding block when a coding mode of a target coding block is intra prediction,

said video decoding device decodes said intra merge direction when
said video decoding device identifies said intra prediction parameter used to perform intra prediction on said target partition is identical to said intra prediction parameter used to perform intra prediction on said neighboring partition adjacent to top or left of said partition according to said intra merge flag, when there are two or more neighboring partitions adjacent to top or left of said target partition, a first partition in a direction away from a top left of said partition is regarded as each of neighboring partitions adjacent to the top and the left of said partition,

said video decode device specifies the intra prediction parameter of the partition adjacent to the top or the left by the intra merge direction and generates the prediction image on a basis of the intra prediction parameter specified by said video decode device,

when said video decode device identifies said intra prediction parameter for said target partition is not identical to said intra prediction parameter for said neighboring partition adjacent to top or left of said partition according to said intra merge flag, said video decoding device decodes said intra prediction parameter for said partition to generate the prediction image on a basis of the intra prediction parameter of the partition, and

said video decoding device generates a decoded image by adding the prediction difference signal and the prediction image.

Claim 4.

A computer readable storage medium storing coded video data comprising coded data having a coding mode for each of coding blocks divided up to an upper limit on the number of hierarchical layers;

the coded video data into which coded data of the plurality of the coding blocks, the maximum size of the coding block, and the number of the hierarchical layers of the coding block are multiplexed; and

the coded data comprising the coding mode of the coding block and including coded data associated with partitions of the coding block,

the coded data including:

an intra merge flag indicating whether or not an intra prediction parameter used to perform intra prediction on a partition of said coding block is identical to an intra prediction parameter used to perform intra prediction on a neighboring partition adjacent to top or left of said

partition,

an intra merge direction specifying one of neighboring partitions adjacent to top and left of said partition of which intra prediction parameter is identical to said intra prediction parameter used to perform intra prediction on said partition when said intra prediction parameter used to perform intra prediction on said partition is identical to said intra prediction parameter used to perform intra prediction on a neighboring partition adjacent to top or left of said partition, and

an intra prediction parameter of the partition when the intra merge flag indicates that the intra prediction parameter used for performing intra prediction on the partition is not identical to the intra prediction parameter used for performing intra prediction on a partition adjacent to a top or a left of the partition,

compressed data of a difference image between the prediction image generated by the prediction process according to the coding mode and an input image,

prediction difference encoding parameters including a quantization parameter used by an inverse transformation process on the compressed data and a transformation block size,

wherein a video decoding device for decoding the coded video data generates a prediction difference signal by performing the inverse transformation process on the compressed data and an inverse transformation process in units of a block having a transformation block size,

said video decoding device decodes the intra merge flag for said partition of said coding block when a coding mode of a target coding block is intra prediction,

said video decoding device decodes said intra merge direction when
said video decoding device identifies said intra prediction parameter used to perform intra prediction on said target partition is identical to said intra prediction parameter used to perform intra prediction on said neighboring partition adjacent to top or left of said partition according to said intra merge flag, when there are two or more neighboring partitions adjacent to top or left of said target partition, a first partition in a direction away from a top left of said partition is regarded as each of neighboring partitions adjacent to the top and the left of said partition,

said video decode device specifies the intra prediction parameter of the partition adjacent to the top or the left by the intra merge direction and generates the prediction image on a basis of the intra prediction parameter specified by said video decode device,

when said video decode device identifies said intra prediction parameter for said target partition is not identical to said intra prediction parameter for said

neighboring partition adjacent to top or left of said partition according to said intra merge flag, said video decoding device decodes said intra prediction parameter for said partition to generate the prediction image on a basis of the intra prediction parameter of the partition, and

said video decoding device generates a decoded image by adding the prediction difference signal and the prediction image.