Claims

[Claim 1]

A prediction image generation apparatus for generating a prediction image by using an intra prediction parameter including a Cross-Component Linear Model (CCLM) prediction mode, the prediction image generation apparatus comprising:

CCLM prediction parameter circuitry that derives:

(i) a first difference value, which is a difference between a first chrominance sample value and a second chrominance sample value,

(ii) a first variable by using (a) a second difference value, which is a difference between a first luminance sample value and a second luminance sample value, (b) a first logarithmic value derived by using the second difference value, and (c) a right shift operation,

(iii) a shift value by using a second logarithmic value derived by using an absolute value of the first difference value, and

(iv) a CCLM prediction parameter by using (a) the first variable, (b) the first difference value, and (c) the shift value; and

a CCLM prediction filter that derives the prediction image by using the CCLM prediction parameter,

wherein

the CCLM prediction parameter is derived by right shifting a second variable by the shift value, wherein the second variable is a sum of a third variable and a value of a rounding parameter, wherein the third variable is a product of (i) the first difference value and (ii) a value, in a reference table, defined by using the first variable.

[Claim 2]

The prediction image generation apparatus of claim 1, wherein a first value and a last value in the reference table is equal to 0.

[Claim 3]

A video decoding apparatus configured to decode an image by adding a prediction image generated from the CCLM prediction filter according to claim 1 and a residual.

[Claim 4]

A video coding apparatus configured to code a residual from a difference between a prediction image derived from the CCLM prediction filter according to claim 1 and an input image.

[Claim 5]

A prediction image generation method for generating a prediction image by using an intra prediction parameter including a Cross-Component Linear Model (CCLM) prediction mode, the prediction image generation method including:

deriving a first difference value, which is a difference between a first chrominance sample value and a second chrominance sample value,

deriving a first variable by using (i) a second difference value, which is a difference between a first luminance sample value and a second luminance sample value, (ii) a first logarithmic value derived by using the second difference value, and (iii) a right shift operation,

deriving a shift value by using a second logarithmic value derived by using an absolute value of the first difference value, and

deriving a CCLM prediction parameter by right shifting a second variable by the shift value, wherein the second variable is a sum of a third variable and a value of a rounding parameter, wherein the third variable is a product of (i) the first difference value and (ii) a value, in a reference table, defined by using the first variable; and

deriving the prediction image by using the CCLM prediction parameter.