

CLAIMS

1. A method of processing video data, comprising:

determining, for a conversion between a current video block of a video that is a chroma block and a bitstream of the video, parameters of cross-component linear model (CCLM) at least based on selected chroma samples that are selected from neighboring chroma samples of the current video block, wherein positions of the selected chroma samples are derived from a first position offset value (F) and a step value (S), and wherein the F and S are derived at least based on availabilities of the neighboring chroma samples of the current video block and a dimension of the current video block;

applying the CCLM on luma samples located in a luma block corresponding to the current video block to derive prediction values of the current video block; and

performing the conversion based on the prediction values,

wherein the selected chroma samples are a subset of the neighboring chroma samples based on the dimension of the current video block, and the CCLM is an intra prediction mode,

wherein the neighboring chroma samples include left neighboring chroma samples, above neighboring chroma samples, above-right neighboring chroma samples, or below-left neighboring chroma samples relative to the current video block,

wherein in response to the neighboring chroma samples of the current video block being unavailable, the prediction values of the current video block are set to a default value, and

wherein the default value is equal to $1 \ll (\text{BitDepth} - 1)$, wherein BitDepth represents the bit-depth of the chroma samples,

wherein $F = \text{Floor}(M/2^i)$, wherein M is a number of the neighboring chroma samples used to derive the selected chroma samples in horizontal direction, or $F = \text{Floor}(N/2^i)$, wherein N is a number of the neighboring chroma samples used to derive the selected chroma samples in vertical direction, i is equal to 2 or 3, and the Floor operation is used to obtain an integer part of a number,

wherein $S = \text{Max}(1, \text{Floor}(M/2^j))$, or $S = \text{Max}(1, \text{Floor}(N/2^j))$, j is equal to 1 or 2, and the Max operation is used to obtain a maximum of multiple numbers,

wherein the CCLM mode of the current video block is one of a first CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the above

neighboring chroma samples, a second CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the below-left neighboring samples, and a third CCLM mode that derives the parameters of CCLM based on the above neighboring chroma samples and the above-right neighboring chroma sample,

5 wherein in response to the CCLM mode being the first CCLM mode and the above neighboring chroma samples being available, M is equal to W .

2. The method of claim 1, wherein the M and N are both less than or equal to $W+H$, and determined based on a CCLM mode of the current video block, wherein W and H is a width and
10 a height of the current video block, respectively.

3. The method of claim 1, wherein in response to selecting two chroma samples in horizontal direction, positions of two selected chroma samples in horizontal direction are $\text{Floor}(M/4)$ and $\text{Floor}(M/4) + \text{Floor}(M/2)$.
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4. The method of claim 1, wherein in response to selecting two chroma samples in vertical direction, positions of two selected chroma samples in vertical direction are $\text{Floor}(N/4)$ and $\text{Floor}(N/4) + \text{Floor}(N/2)$.

20 5. The method of claim 1, wherein in response to selecting four chroma samples in horizontal direction, positions of four selected chroma samples in horizontal direction are $\text{Floor}(M/8)$, $\text{Floor}(M/8) + \text{Floor}(M/4)$, $\text{Floor}(M/8) + 2 * \text{Floor}(M/4)$, $\text{Floor}(M/8) + 3 * \text{Floor}(M/4)$.

25 6. The method of claim 1, wherein in response to selecting four chroma samples in vertical direction, positions of four selected chroma samples in vertical direction are $\text{Floor}(N/8)$, $\text{Floor}(N/8) + \text{Floor}(N/4)$, $\text{Floor}(N/8) + 2 * \text{Floor}(N/4)$, $\text{Floor}(N/8) + 3 * \text{Floor}(N/4)$.

7. The method of claim 1, wherein in response to the CCLM mode being the third CCLM mode, the above neighboring chroma samples being available, and the above-right neighboring chroma samples being unavailable, M is equal to W .
- 5 8. The method of claim 1, wherein in response to the CCLM mode being the first CCLM mode and the left neighboring chroma samples are available, N is equal to H .
9. The method of claim 1, wherein in response to the CCLM mode being the second CCLM mode, the left neighboring chroma samples being available, and the below-left neighboring
10 chroma samples being unavailable, N is equal to H .
10. The method of claim 1, wherein the conversion includes encoding the current video block into the bitstream.
- 15 11. The method of claim 1, wherein the conversion includes decoding the current video block from the bitstream.
12. An apparatus for processing video data comprising a processor and a non-transitory memory with instructions thereon, wherein the instructions upon execution by the processor,
20 cause the processor to:
 - determine, for a conversion between a current video block of a video that is a chroma block and a bitstream of the video, parameters of cross-component linear model (CCLM) at least based on selected chroma samples that are selected from neighboring chroma samples of the current video block, wherein positions of the selected chroma samples are derived from a first
25 position offset value (F) and a step value (S), and wherein the F and S are derived at least based on availabilities of the neighboring chroma samples of the current video block and a dimension of the current video block;
 - apply the CCLM on luma samples located in a luma block corresponding to the current video block to derive prediction values of the current video block; and
 - 30 perform the conversion based on the prediction values,

wherein the selected chroma samples are a subset of the neighboring chroma samples based on the dimension of the current video block, and the CCLM is an intra prediction mode,

wherein the neighboring chroma samples include left neighboring chroma samples, above neighboring chroma samples, above-right neighboring chroma samples, or below-left

5 neighboring chroma samples relative to the current video block,

wherein in response to the neighboring chroma samples of the current video block being unavailable, the prediction values of the current video block are set to a default value, and

wherein the default value is equal to $1 \ll (\text{BitDepth} - 1)$, wherein BitDepth represents the bit-depth of the chroma samples,

10 wherein $F = \text{Floor}(M/2^i)$, wherein M is a number of the neighboring chroma samples used to derive the selected chroma samples in horizontal direction, or $F = \text{Floor}(N/2^i)$, wherein N is a number of the neighboring chroma samples used to derive the selected chroma samples in vertical direction, i is equal to 2 or 3, and the Floor operation is used to obtain an integer part of a number,

15 wherein $S = \text{Max}(1, \text{Floor}(M/2^j))$, or $S = \text{Max}(1, \text{Floor}(N/2^j))$, j is equal to 1 or 2, and the Max operation is used to obtain a maximum of multiple numbers,

wherein the CCLM mode of the current video block is one of a first CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the above neighboring chroma samples, a second CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the below-left neighboring samples, and a third CCLM mode that derives the parameters of CCLM based on the above neighboring chroma samples and the above-right neighboring chroma sample,

wherein in response to the CCLM mode being the first CCLM mode and the above neighboring chroma samples being available, M is equal to W.

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13. A non-transitory computer-readable storage medium storing instruction that cause a processor to:

determine, for a conversion between a current video block of a video that is a chroma block and a bitstream of the video, parameters of cross-component linear model (CCLM) at least based on selected chroma samples that are selected from neighboring chroma samples of the current video block, wherein positions of the selected chroma samples are derived from a first

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position offset value (F) and a step value (S), and wherein the F and S are derived at least based on availabilities of the neighboring chroma samples of the current video block and a dimension of the current video block;

apply the CCLM on luma samples located in a luma block corresponding to the current video block to derive prediction values of the current video block; and

perform the conversion based on the prediction values,

wherein the selected chroma samples are a subset of the neighboring chroma samples based on the dimension of the current video block, and the CCLM is an intra prediction mode,

wherein the neighboring chroma samples include left neighboring chroma samples, above neighboring chroma samples, above-right neighboring chroma samples, or below-left neighboring chroma samples relative to the current video block,

wherein in response to the neighboring chroma samples of the current video block being unavailable, the prediction values of the current video block are set to a default value, and

wherein the default value is equal to $1 \ll (\text{BitDepth} - 1)$, wherein BitDepth represents the bit-depth of the chroma samples,

wherein $F = \text{Floor}(M/2^i)$, wherein M is a number of the neighboring chroma samples used to derive the selected chroma samples in horizontal direction, or $F = \text{Floor}(N/2^i)$, wherein N is a number of the neighboring chroma samples used to derive the selected chroma samples in vertical direction, i is equal to 2 or 3, and the Floor operation is used to obtain an integer part of a number,

wherein $S = \text{Max}(1, \text{Floor}(M/2^j))$, or $S = \text{Max}(1, \text{Floor}(N/2^j))$, j is equal to 1 or 2, and the Max operation is used to obtain a maximum of multiple numbers,

wherein the CCLM mode of the current video block is one of a first CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the above neighboring chroma samples, a second CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the below-left neighboring samples, and a third CCLM mode that derives the parameters of CCLM based on the above neighboring chroma samples and the above-right neighboring chroma sample,

wherein in response to the CCLM mode being the first CCLM mode and the above neighboring chroma samples being available, M is equal to W.

14. A non-transitory computer-readable recording medium storing a bitstream of a video which is generated by a method performed by a video processing apparatus, wherein the method comprises:

- 5 determining, for a conversion between a current video block of a video that is a chroma block and the bitstream, parameters of cross-component linear model (CCLM) at least based on selected chroma samples that are selected from neighboring chroma samples of the current video block, wherein positions of the selected chroma samples are derived from a first position offset value (F) and a step value (S) value, and wherein the F and S are derived at least based on availabilities of the neighboring chroma samples of the current video block and a dimension of
 - 10 the current video block;
 - applying the CCLM on luma samples located in a luma block corresponding to the current video block to derive prediction values of the current video block; and
 - generating the bitstream from the current video block based on the determining, wherein the selected chroma samples are a subset of the neighboring chroma samples
 - 15 based on the dimension of the current video block, and the CCLM is an intra prediction mode, wherein the neighboring chroma samples include left neighboring chroma samples, above neighboring chroma samples, above-right neighboring chroma samples, or below-left neighboring chroma samples relative to the current video block,
 - wherein in response to the neighboring chroma samples of the current video block being
 - 20 unavailable, the prediction values of the current video block are set to a default value, and wherein the default value is equal to $1 \ll (\text{BitDepth} - 1)$, wherein BitDepth represents the bit-depth of the chroma samples,
 - wherein $F = \text{Floor}(M/2^i)$, wherein M is a number of the neighboring chroma samples used to derive the selected chroma samples in horizontal direction, or $F = \text{Floor}(N/2^i)$, wherein N is a
 - 25 number of the neighboring chroma samples used to derive the selected chroma samples in vertical direction, i is equal to 2 or 3, and the Floor operation is used to obtain an integer part of a number,
 - wherein $S = \text{Max}(1, \text{Floor}(M/2^j))$, or $S = \text{Max}(1, \text{Floor}(N/2^j))$, j is equal to 1 or 2, and the Max operation is used to obtain a maximum of multiple numbers,
 - 30 wherein the CCLM mode of the current video block is one of a first CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the above

neighboring chroma samples, a second CCLM mode that derives the parameters of CCLM based on the left neighboring chroma samples and the below-left neighboring samples, and a third CCLM mode that derives the parameters of CCLM based on the above neighboring chroma samples and the above-right neighboring chroma sample,

- 5 wherein in response to the CCLM mode being the first CCLM mode and the above neighboring chroma samples being available, M is equal to W .