CONDITIONAL SIGNALING OF VIDEO CODING SYNTAX ELEMENTS

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application is based on International Patent Application No. PCT/US2021/028974, filed on April 23, 2021, which claims the priority to and benefits of U.S. Provisional Patent Application No. 63/015,623, filed on April 26, 2020. All the aforementioned patent applications are hereby incorporated by reference in their entireties.

TECHNICAL FIELD

[002] This patent document relates to image and video coding and decoding.

BACKGROUND

[003] Digital video accounts for the largest bandwidth use on the internet and other digital communication networks. As the number of connected user devices capable of receiving and displaying video increases, it is expected that the bandwidth demand for digital video usage will continue to grow.

SUMMARY

[004] The present document discloses techniques that can be used by video encoders and decoders for processing coded representation of video using control information useful for decoding of the coded representation.

[005] In one example aspect, a video processing method is disclosed. The method includes performing a conversion between a video having one or more chroma components, the video comprising one or more video pictures comprising one or more slices and a coded representation of the video, wherein the coded representation conforms to a format rule, wherein the format rule specifies that a chroma array type field controls a constraint on a conversion characteristic of chroma used during the conversion.

[006] In another example aspect, another video processing method is disclosed. The method includes performing a conversion between a video comprising one or more video pictures comprising one or more video regions and a coded representation of the video, wherein the coded

CLAIMS

1. A method of processing video data, comprising:

performing a conversion between a video comprising one or more pictures and a bitstream of the video according to a format rule, and

wherein the format rule specifies that a first syntax element that indicates whether motion vector difference coding syntax structure for a particular reference picture list (RPL) is parsed or not parsed is included in the bitstream when (i) a value of a second syntax element indicates that an RPL information is not present in a picture header or (ii) a value of a third syntax element indicates a number of reference pictures in the particular RPL is greater than 0 in case that the RPL information is present in the picture header, and the first syntax element is excluded from the bitstream when the value of the second syntax element indicates that the RPL information is present in the picture header and the value of the third syntax element indicates the number of the reference pictures in the particular RPL is equal to 0.

2. The method of claim 1, wherein the particular RPL corresponds to reference picture list 1.

3. The method of claim 1 or 2, wherein the format rule further specifies that a value of the first syntax element is inferred to be equal to 1 in case that the first syntax element is not included in the bitstream, wherein the value of the first syntax element equal to 1 specifies that the motion vector difference coding syntax structure for the particular RPL is not parsed.

4. The method of any one of claims 1-3, wherein the format rule further specifies that a fourth syntax element that indicates a number of weights signaled for entries in the particular RPL is conditionally included in a weighted prediction parameters syntax structure indicating a table of weighted prediction parameters of the bitstream based on (iii) a fifth syntax element included in a picture parameter set indicating an applicability of explicit weighted prediction (WP) to B slices referring to the picture parameter set information, and (iv) a sixth syntax element indicating whether WP information is included in the picture header, and (iii) the third syntax element indicating the number of the reference pictures in the particular RPL.

5. The method of claim 4, wherein the format rule specifies that the fourth syntax element is included in the weighted prediction parameters syntax structure upon satisfying (1) the fifth syntax element having a first value which specifies that the explicit WP is applied to B slices referring to the picture parameter set, wherein the first value is equal to 1, (2) the sixth syntax element having a second value which specifies that a possible presence of the WP information in the picture header and a non-presence of the WP information in slice headers referring to the picture parameter set that do not contain a picture header, wherein the second value is equal to 1, and (3) the value of the third syntax element indicating the number of the reference pictures in the particular RPL being greater than 0.

6. The method of claim 4 or 5, wherein the format rule specifies that the fourth syntax element is excluded from the weighted prediction parameters syntax structure upon not satisfying at least one of (1) the fifth syntax element having a first value which specifies that the explicit WP is applied to B slices referring to the picture parameter set, (2) the sixth syntax element having a second value which specifies that a possible presence of the WP information in the picture header and a non-presence of the WP information in slice headers referring to the picture parameter set that do not contain a picture header, and (3) the value of the third syntax element indicating the number of the reference pictures in the particular RPL being greater than 0.

7. The method of any one of claims 4-6, wherein the format rule specifies that a value of a first variable NumWeightsL1 corresponding to weights for the particular RPL is derived as follows:

if(!pps_weighted_bipred_flag | | (pps_wp_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] = = 0))

NumWeightsL1 = 0

else if(pps_wp_info_in_ph_flag)

NumWeightsL1 = num_l1_weights

else

NumWeightsL1 = NumRefIdxActive[1],

wherein pps_weighted_bipred_flag is the fifth syntax element, pps_wp_info_in_ph_flag is the sixth syntax element, num_ref_entries[1][RplsIdx[1]] is the third syntax element, num_l1_weights is the fourth syntax element, and NumRefIdxActive[1] is a second variable

indicating a number of active reference pictures in the reference picture list 1 that allowed to be used to code at least one slice.

8. The method of any one of claims 1-7, wherein the format rule specifies which general constraint syntax elements in a general constraint information syntax structure that indicates one or more constraints applicable to the conversion are grouped together, general constraint syntax elements in a particular group are signaled together without interlacing with other general constraint syntax elements in another group.

9. The method of claim 8, wherein the rule specifies that inter-related syntax elements are grouped together, wherein the inter-related syntax elements include general constraint syntax elements about characteristics including at least one of reference picture resampling, resolution change in a coded layer video sequence, weighted prediction, reference wraparound, temporal motion vector prediction, subblock-based temporal motion vector prediction, adaptive motion vector prediction, bi-directional optical flow, symmetric motion vector difference, decoder-side motion vector derivation, merge based motion vector difference, affine motion prediction, prediction refinement with optical flow, bi-prediction with CU (coding unit) weights, combined inter-intra prediction CIIP, or geometric prediction mode.

10. The method of claim 8 or 9, wherein the rule specifies that intra-related syntax elements are grouped together, wherein the intra-related syntax elements include general constraint syntax elements about characteristics including at least one of a palette coding mode, intra block copy mode, intra sub-partitions (ISP), multi-reference line intra prediction, matrix-based intra prediction, or cross-component linear model.

11. The method of any one of claims 1-10, wherein the conversion includes encoding the video into the bitstream.

12. The method of any one of claims 1-10, wherein the conversion includes decoding the video from the bitstream.

13. 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, cause the processor to:

perform a conversion between a video comprising one or more pictures and a bitstream of the video according to a format rule, and

wherein the format rule specifies that a first syntax element that indicates whether motion vector difference coding syntax structure for a particular reference picture list (RPL) is parsed or not parsed is included in the bitstream when (i) a value of a second syntax element indicates that an RPL information is not present in a picture header or (ii) a value of a third syntax element indicates a number of reference pictures in the particular RPL is greater than 0 in case that the RPL information is present in the picture header, and the first syntax element is excluded from the bitstream when the value of the second syntax element indicates that the RPL information is present in the picture header and the value of the third syntax element indicates the number of the reference pictures in the particular RPL is equal to 0.

14. The apparatus of claim 13, wherein the particular RPL corresponds to reference picture list 1,

wherein the format rule further specifies that a value of the first syntax element is inferred to be equal to 1 in case that the first syntax element is not included in the bitstream, wherein the value of the first syntax element equal to 1 specifies that the motion vector difference coding syntax structure for the particular RPL is not parsed.

15. The apparatus of claim 13 or 14, wherein the format rule further specifies that a fourth syntax element that indicates a number of weights signaled for entries in the particular RPL is conditionally included in a weighted prediction parameters syntax structure indicating a table of weighted prediction parameters of the bitstream based on (iii) a fifth syntax element included in a picture parameter set indicating an applicability of explicit weighted prediction (WP) to B slices referring to the picture parameter set information, and (iv) a sixth syntax element indicating whether WP information is included in the picture header, and (iii) the third syntax element indicating the number of the reference pictures in the particular RPL.

16. The apparatus of claim 15, wherein the format rule specifies that the fourth syntax element is included in the weighted prediction parameters syntax structure upon satisfying (1) the fifth syntax element having a first value which specifies that the explicit WP is applied to B slices referring to the picture parameter set, wherein the first value is equal to 1, (2) the sixth syntax element having a second value which specifies that a possible presence of the WP information in the picture header and a non-presence of the WP information in slice headers referring to the picture parameter set that do not contain a picture header, wherein the second value is equal to 1, and (3) the value of the third syntax element indicating the number of the reference pictures in the particular RPL being greater than 0,

wherein the format rule specifies that the fourth syntax element is excluded from the weighted prediction parameters syntax structure upon not satisfying at least one of (1) the fifth syntax element having a first value which specifies that the explicit WP is applied to B slices referring to the picture parameter set, (2) the sixth syntax element having a second value which specifies that a possible presence of the WP information in the picture header and a non-presence of the WP information in slice headers referring to the picture parameter set that do not contain a picture header, and (3) the value of the third syntax element indicating the number of the reference pictures in the particular RPL being greater than 0, and

wherein the format rule specifies that a value of a first variable NumWeightsL1 corresponding to weights for the particular RPL is derived as follows:

if(!pps_weighted_bipred_flag || (pps_wp_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] = = 0))

NumWeightsL1 = 0

else if(pps_wp_info_in_ph_flag)

NumWeightsL1 = num_l1_weights

else

NumWeightsL1 = NumRefIdxActive[1],

wherein pps_weighted_bipred_flag is the fifth syntax element, pps_wp_info_in_ph_flag is the sixth syntax element, num_ref_entries[1][RplsIdx[1]] is the third syntax element, num_l1_weights is the fourth syntax element, and NumRefIdxActive[1] is a second variable indicating a number of active reference pictures in the reference picture list 1 that allowed to be used to code at least one slice.

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

perform a conversion between a video comprising one or more pictures and a bitstream of the video according to a format rule, and

wherein the format rule specifies that a first syntax element that indicates whether motion vector difference coding syntax structure for a particular reference picture list (RPL) is parsed or not parsed is included in the bitstream when (i) a value of a second syntax element indicates that an RPL information is not present in a picture header or (ii) a value of a third syntax element indicates a number of reference pictures in the particular RPL is greater than 0 in case that the RPL information is present in the picture header, and the first syntax element is excluded from the bitstream when the value of the second syntax element indicates that the RPL information is present in the picture header and the value of the third syntax element indicates the number of the reference pictures in the particular RPL is equal to 0.

18. The non-transitory computer-readable storage medium of claim 17, wherein the particular RPL corresponds to reference picture list 1,

wherein the format rule further specifies that a value of the first syntax element is inferred to be equal to 1 in case that the first syntax element is not included in the bitstream, wherein the value of the first syntax element equal to 1 specifies that the motion vector difference coding syntax structure for the particular RPL is not parsed, and

wherein the format rule further specifies that a fourth syntax element that indicates a number of weights signaled for entries in the particular RPL is conditionally included in a weighted prediction parameters syntax structure indicating a table of weighted prediction parameters of the bitstream based on (iii) a fifth syntax element included in a picture parameter set indicating an applicability of explicit weighted prediction (WP) to B slices referring to the picture parameter set information, and (iv) a sixth syntax element indicating whether WP information is included in the picture header, and (iii) the third syntax element indicating the number of the reference pictures in the particular RPL.

19. 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:

generating the bitstream of the video comprising one or more pictures according to a format rule, and

wherein the format rule specifies that a first syntax element that indicates whether motion vector difference coding syntax structure for a particular reference picture list (RPL) is parsed or not parsed is included in the bitstream when (i) a value of a second syntax element indicates that an RPL information is not present in a picture header or (ii) a value of a third syntax element indicates a number of reference pictures in the particular RPL is greater than 0 in case that the RPL information is present in the picture header, and the first syntax element is excluded from the bitstream when the value of the second syntax element indicates that the RPL information is present in the picture header and the value of the third syntax element indicates the number of the reference pictures in the particular RPL is equal to 0.

20. The non-transitory computer-readable recording medium of claim 19, wherein the particular RPL corresponds to reference picture list 1,

wherein the format rule further specifies that a value of the first syntax element is inferred to be equal to 1 in case that the first syntax element is not included in the bitstream, wherein the value of the first syntax element equal to 1 specifies that the motion vector difference coding syntax structure for the particular RPL is not parsed, and

wherein the format rule further specifies that a fourth syntax element that indicates a number of weights signaled for entries in the particular RPL is conditionally included in a weighted prediction parameters syntax structure indicating a table of weighted prediction parameters of the bitstream based on (iii) a fifth syntax element included in a picture parameter set indicating an applicability of explicit weighted prediction (WP) to B slices referring to the picture parameter set information, and (iv) a sixth syntax element indicating whether WP information is included in the picture header, and (iii) the third syntax element indicating the number of the reference pictures in the particular RPL.