SIGNALING FOR INTER PREDICTION IN HIGH LEVEL SYNTAX

CROSS REFERENCE TO RELATED APPLICATIONS

[001] ~~Under the applicable patent law and/or rules pursuant to the Paris Convention, this application is made to timely claim the priority to and benefit of International Patent Application No. PCT/CN2020/083569, filed on April 7, 2020. For all purposes under the law, the entire disclosure of the aforementioned application is incorporated by reference as part of the disclosure of this application.~~This application is based on International Patent Application No. PCT/CN2021/085772, filed on April 7, 2021, which claims the priority to and benefit of International Patent Application No. PCT/CN2020/083569, filed on April 7, 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 representation conforms to a format rule that specifies the include a deblocking mode indicator for

CLAIMS

1. A method of video processing, comprising:

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

wherein the format rule specifies that a variable X indicates whether B slice is allowed or used in a video region, and

wherein the format rule further specifies that the variable X is based on values of a reference picture list information present flag and/or a field indicating a number of entries in a reference picture list syntax structure.

2. The method of claim 1, wherein the video region corresponds to a picture or a slice.

3. The method of claim 1 or 2, wherein the reference picture list information present flag is in a picture header.

4. The method of any of claims 1 to 3, wherein the reference picture list information present flag is rpl_info_in_ph_flag and the field indicating the number of entries in the reference picture list syntax structure is num_ref_entries [i][RplsIdx [i]], and wherein the variable X is derived using at least one of followings:

a) (rpl_info_in_ph_flag && num_ref_entries[0][RplsIdx[0]] > 0 && num_ref_entries[1][RplsIdx[1]] > 0);

b) (rpl_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] > 0);

c) (rpl_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] > 1);

d) (rpl_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] > 0);

e) based on a number of active reference indices to be used for a slice; or

f) based on a number of allowed reference pictures for list 1,

whereby i is an integer.

1. A method of video processing, comprising:

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

wherein the format rule specifies that a first syntax element indicates whether a bi-directional optical flow inter prediction based inter bi-prediction is disabled for a video region of the one or more video regions, and

wherein the format rule further specifies that a presence in a picture header of the first syntax element is based on values of a second syntax element which is a reference picture list information present flag that indicates whether the reference picture list information is present in the picture header and a third syntax element indicating a number of entries in a reference picture list syntax structure.

2. The method of claim 1, wherein the video region corresponds to a picture or a slice.

3. The method of claim 1 or 2, wherein the second syntax element is rpl_info_in_ph_flag and the third syntax element is num_ref_entries [i][RplsIdx [i]], wherein i is an integer, and

wherein the first syntax element is present in the picture header at least based on (rpl_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] > 0), wherein num_ref_entries[1][RplsIdx[1]] indicates that the number of entries in the RplsIdx[1]-th reference picture list syntax structure for a reference picture list 1.

4. The method of claim 3, wherein the first syntax element being present in the picture header is further based on a value of a fourth syntax element indicating that the first syntax element is allowed to be present.

5. The method of any one of claims 1-4, wherein the format rule further specifies that a presence in the picture header of a fifth syntax element indicating whether a decoder-side motion vector refinement is disabled is based on the values of the second syntax element and the third syntax element.

5. The method of any of claims 1 to 4, wherein the format rule further specifies that signaling and/or semantics and/or inference of one or more syntax elements included in the syntax structure corresponding to a picture header is dependent on the variable X.

6. The method of claim 5, wherein the one or more syntax elements enable a coding tool which requires more than one prediction signal.

7. The method of claim 6, wherein the coding tool corresponds to a bi-prediction, a mixed intra and inter coding, or prediction with linear or non-linear weighting from multiple prediction blocks.

8. The method of claim 6, wherein the one or more syntax elements include a first syntax element indicating whether collocated pictures used for temporal motion vector prediction is derived from a reference picture list 0 or reference picture list 1, a second syntax element indicating whether motion vector difference coding syntax structure for list 1 is parsed or not, a third syntax element indicating whether a bi-directional optical flow coding is disabled, a fourth syntax element indicating whether a decoder side motion vector refinement is disabled, a fifth syntax element indicating a number of weights signalled for entries in the reference picture list 1.

9. The method of claim 8, wherein the first syntax element corresponds to ph_collocated_from_l0_flag, the second syntax element corresponds to ph_mvd_l1_zero_flag, the third syntax element corresponds to ph_disable_bdof_flag, the fourth syntax element corresponds to ph_disable_dmvr_flag, and the fifth syntax element corresponds to num_l1_weights.

10. The method of claim 5, wherein the format rule further specifies that, only in case that the variable X indicates that the picture contains one or more B slices, the one or more syntax elements are included.

11. The method of claim 5, wherein the format rule further specifies that in case that the variable X indicates that the picture contains no B slices, the one or more syntax elements are skipped.

6. The method of claim 5, wherein the fifth syntax element is present in the picture header, when a value of a sixth syntax element indicates that the fifth syntax element is allowed to be present, a value of the second syntax element rpl_info_in_ph_flag is equal to 1 and a value of the third syntax element num_ref_entries[1][RplsIdx[1]] is greater than 1.

7. The method of any one of claims 1-6, wherein the format rule further specifies that a presence in the picture header of a seventh syntax element indicating whether motion vector difference coding syntax structure for list 1 is parsed or not is at least based on that a value of the second syntax element rpl_info_in_ph_flag is equal to 1 and a value of the third syntax element num_ref_entries[1][RplsIdx[1]] is greater than 1.

8. The method of any one of claims 1-7, wherein the format rule further specifies that a presence in the picture header of an eighth syntax element indicating whether collocated pictures used for temporal motion vector prediction is derived from a reference picture list 0 or reference picture list 1 is at least based on that a value of the second syntax element rpl_info_in_ph_flag is equal to 1 and a value of the third syntax element num_ref_entries[1][RplsIdx[1]] is greater than 1.

9. The method of claim 8, wherein the format rule further specifies that when a value of a ninth syntax element indicates that a temporal motion vector predictor is enabled, the value of the second syntax element rpl_info_in_ph_flag is equal to 1 and the value of the third syntax element num_ref_entries[1][RplsIdx[1]] is equal to 0, the value of the eighth syntax element is inferred to be equal to 1 which indicates that the collocated pictures used for temporal motion vector prediction is derived from the reference picture list 0.

10. The method of any one of claims 1-9, wherein the format rule further specifies that a presence in the picture header of a tenth syntax element indicating a number of weights signalled for entries in a reference picture list 1 is at least based on that a value of the second syntax element rpl_info_in_ph_flag is equal to 1 and a value of the third syntax element num_ref_entries[1][RplsIdx[1]] is greater than 1.

12. The method of claim 5, wherein the format rule further specifies whether to signal the one or more syntax elements are based on the variable X.

13. The method of claim 5, wherein the format rule further specifies that when the variable X is equal to 0 and a syntax element indicating whether motion vector difference coding syntax structure is parsed or not is not signaled, a value of the syntax element is inferred to be equal to a certain value.

14. The method of claim 13, wherein the format rule further specifies that when the variable X being set to "rpl_info_in_ph_flag" is equal to 0, the value of the syntax element is inferred to be equal to 1.

15. The method of claim 13, wherein the format rule further specifies that when the variable X being set to "num_ref_entries[1][RplsIdx[1]] > 0" is equal to 0, the value of the syntax element is inferred to be equal to 1.

16. The method of claim 5, wherein the format rule further specifies that the inference of the one or more syntax elements is dependent on a value of the variable X.

17. The method of claim 16, wherein the one or more syntax elements include a PH (picture header) syntax element indicating whether a bi-directional optical flow coding is disabled and wherein the format rule specifies that a value of the PH syntax element is inferred based on the value of the variable X.

18. The method of claim 16, wherein the one or more syntax elements include a PH (picture header) syntax element indicating whether a decoder-side motion vector refinement is disabled and wherein the format rule specifies that a value of the PH syntax element is inferred based on the value of the variable X.

19. The method of claim 16, wherein the one or more syntax elements include a PH (picture header) syntax element indicating whether collocated pictures used for temporal motion vector

11. The method of any one of claims 1-10, wherein the format rule further specifies that a presence of an eleventh syntax element in a sequence parameter set that indicates a constrain on loop filtering across subpicture boundaries is based on whether a number of subpictures in the picture is greater than 1,

wherein the eleventh syntax element equal to 1 specifies that all subpicture boundaries in a coded layer video sequence are treated as picture boundaries and there is no loop filtering across the subpicture boundaries,

wherein the eleventh syntax element is not present in case that the number of subpictures in the picture is equal to 1, and

wherein in case that the syntax element is not present, a value of the syntax element is inferred to be equal to 1.

12. The method of any one of claims 1-11, wherein the format rule further specifies that in case that a twelfth syntax element is not present, a value of the twelfth syntax element is inferred to be equal to 1 that specifies an i-th subpicture of each coded picture in a coded layer video sequence is treated as a picture in an encoding or a decoding process excluding in-loop filtering operations, wherein i is an integer.

13. The method of claim 12, wherein the format rule further specifies that during an inter-prediction process, how clipping is performed at a boundary of the video region is based on a thirteenth syntax element at a picture parameter set level, specifying whether a horizontal wrap-around motion compensation is enabled for pictures referring to the picture parameter set and the twelfth syntax element at a sequence parameter set level.

14. The method of any one of claims 1-13, wherein the conversion includes encoding the video into the bitstream.

15. The method of any one of claims 1-13, wherein the conversion includes decoding the video from the bitstream.

16. An apparatus for processing video data comprising a processor and a non-transitory memory

prediction is derived from a reference picture list 1 or a reference picture list 0 and wherein the format rule specifies that a value of the PH syntax element is inferred to be equal to a certain value in case of satisfying (1) a value of another PH syntax element indicating an applicability of temporal motion vector predictor to a picture is equal to 1, (2) a value of the reference picture list information present flag in a picture header is equal to 1, and (3) the value of the variable X is equal to 0.

20. The method of claim 19, wherein the value of the PH (picture header) syntax element is inferred to be equal to 0 in case of satisfying (1) the value of another PH syntax element indicating the applicability of temporal motion vector predictor to the picture is equal to 1, (2) the value of the reference picture list information present flag in a picture header is equal to 1, and (3) the variable X being set to "num_ref_entries[1][RplsIdx[1]] > 0" is equal to 0.

21. The method of claim 16, wherein the one or more syntax elements include a PH (picture header) syntax element indicating a number of weights signalled for entries in the reference picture list 1and wherein the format rule specifies that a value of the PH syntax element is inferred to be equal to a certain value in case that the variable X is equal to a certain value.

22. The method of claim 21, wherein the value of the PH syntax element is inferred to be equal to 0 in case that the variable X being set to "num_ref_entries[1][RplsIdx[1]] > 0" is equal to 0.

23. The method of claim 22, wherein when the value of the PH syntax element is inferred to be equal to 0, weighted prediction parameters for the reference picture list 1 are not signalled in a picture header or slice headers of a picture.

24. The method of any of claims 1 to 23, wherein the conversion includes encoding the video into the bitstream.

25. The method of any of claims 1 to 23, wherein the conversion includes decoding the video from the bitstream.

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 video regions and a bitstream of the video according to a format rule,

wherein the format rule specifies that a first syntax element indicates whether a bi-directional optical flow inter prediction based inter bi-prediction is disabled for a video region of the one or more video regions, and

wherein the format rule further specifies that a presence in a picture header of the first syntax element is based on values of a second syntax element which is a reference picture list information present flag that indicates whether the reference picture list information is present in the picture header and a third syntax element indicating a number of entries in a reference picture list syntax structure.

17. The apparatus of claim 16, wherein the video region corresponds to a picture or a slice,

wherein the second syntax element is rpl_info_in_ph_flag and the third syntax element is num_ref_entries [i][RplsIdx [i]], wherein i is an integer,

wherein the first syntax element is present in the picture header at least based on (rpl_info_in_ph_flag && num_ref_entries[1][RplsIdx[1]] > 0), wherein num_ref_entries[1][RplsIdx[1]] indicates that the number of entries in the RplsIdx[1]-th reference picture list syntax structure for a reference picture list 1, and

wherein the first syntax element being present in the picture header is further based on a value of a fourth syntax element indicating that the first syntax element is allowed to be present.

18. The apparatus of claim 16 or 17, wherein the format rule further specifies that a presence in the picture header of a fifth syntax element indicating whether a decoder-side motion vector refinement is disabled is based on the values of the second syntax element and the third syntax element, and

wherein the fifth syntax element is present in the picture header, when a value of a sixth syntax element indicates that the fifth syntax element is allowed to be present, a value of the second syntax element rpl_info_in_ph_flag is equal to 1 and a value of the third syntax element num_ref_entries[1][RplsIdx[1]] is greater than 1.

26. The method of claims 1 to 23, wherein the conversion includes generating the bitstream from the video, and the method further comprises: storing the bitstream in a non-transitory computer-readable recording medium.

27. A video processing apparatus comprising a processor configured to implement a method recited in any one or more of claims 1 to 26.

28. A method of storing a bitstream of a video, comprising, a method recited in any one of claims 1 to 26, and further including storing the bitstream to a non-transitory computer-readable recording medium.

29. A computer readable medium storing program code that, when executed, causes a processor to implement a method recited in any one or more of claims 1 to 26.

30. A computer readable medium that stores a bitstream generated according to any of the above described methods.

31. A video processing apparatus for storing a bitstream representation, wherein the video processing apparatus is configured to implement a method recited in any one or more of claims 1 to 26.

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

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

wherein the format rule specifies that a first syntax element indicates whether a bi-directional optical flow inter prediction based inter bi-prediction is disabled for a video region of the one or more video regions, and

wherein the format rule further specifies that a presence in a picture header of the first syntax element is based on values of a second syntax element which is a reference picture list information present flag that indicates whether the reference picture list information is present in the picture header and a third syntax element indicating a number of entries in a reference picture list syntax structure.

20. 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 video regions according to a format rule,

wherein the format rule specifies that a first syntax element indicates whether a bi-directional optical flow inter prediction based inter bi-prediction is disabled for a video region of the one or more video regions, and

wherein the format rule further specifies that a presence in a picture header of the first syntax element is based on values of a second syntax element which is a reference picture list information present flag that indicates whether the reference picture list information is present in the picture header and a third syntax element indicating a number of entries in a reference picture list syntax structure.