

WHAT IS CLAIMED IS CLAIMS:

1. A method of video processing, comprising:
performing a conversion between a video comprising one or more pictures and a bitstream of the video,
wherein the bitstream conforms to a format rule,
wherein the format rule specifies that a derivation of a previous picture in a semantics associated with a first flag and in a decoding process for a picture order count is based on a second flag,
wherein the ~~previous picture associated with the first flag~~ is a previous picture in a decoding order that has (i) a first identifier that is the same as a slice or picture header referring to a reference picture list syntax structure, (ii) a second identifier and the second flag being both equal to zero, and (iii) a picture type different from a random access skipped leading (RASL) picture and a random access decodable leading (RADL) picture,
wherein the first flag indicates whether a third flag is present in the bitstream,
wherein the second flag indicates whether a current picture is allowed to be used as a reference picture, and
wherein the third flag is used to determine a first variable value of one or more most significant bits associated with of a picture order count value of a long-term reference picture.
2. The method of claim 1, wherein the first identifier is an identifier of a layer and is a syntax element, and the second identifier is a temporal identifier and is a variable.
3. ~~The method of claim 1, wherein the first identifier is a syntax element and the second identifier is a variable.~~
43. The method of ~~any of~~ claims 1- ~~or 2 to~~ 3, wherein the first flag is delta_poc_msb_cycle_present_flag, the second flag is ph_non_ref_pic_flag, and the third flag is delta_poc_msb_cycle_ltdelta_poe_msb_cycle_present_flag, and wherein the first identifier is nuh_layer_id and the second identifier is TemporalId.
54. The method of claim 1, ~~A method of video processing, comprising:~~

—performing a conversion between a video comprising one or more pictures and a bitstream of the video,
—wherein the bitstream conforms to a format rule,
—wherein the format rule specifies that a second variable prevNonDiscardableAu, which is used to determine a timing of a removal of a decoding unit (DU) or a decoding of the DU, is access unit (AU) specific, and is derived based on a the second flag that indicates whether a current picture is allowed to be used as a reference picture.

6. The method of claim 5, wherein the variable is prevNonDiscardableAu and the flag is ph_non_ref_pic_flag.

75. The method of claim 61 or 4, wherein the second flag ph_non_ref_pic_flag equaling one specifies that the current picture is never used as the reference picture.

8. The method of claim 6, wherein ph_non_ref_pic_flag and the second flag equaling zero specifies that the current picture is allowed to be or not to ~~might or might not~~ be used as the reference picture.

6. The method of claim 1, 9. A method of video processing, comprising:

—performing a conversion between a video comprising one or more pictures and a bitstream of the video,

—wherein the bitstream conforms to a format rule,

—wherein the format rule specifies that a buffering period (BF) supplemental enhancement information (SEI) message and a picture timing SEI message, when included in the bitstream, are access unit (AU) specific,

wherein a ~~first~~ third variable associated with the buffering period SEI message and a ~~second~~ fourth variable associated with the buffering period SEI message and the picture timing SEI message are derived based on the second ~~a~~ flag that indicates whether a current picture is allowed to be used as a reference picture,

wherein the third ~~first~~ variable is indicative of an ~~access unit~~ AU comprising (i) ~~an~~ the second identifier of the AU that is equal to zero and (ii) at least one ~~a~~ picture that is not a ~~random access skipped leading (RASL) picture or a random access decodable leading (RADL) picture~~ and for which the second flag is equal to zero, and

wherein ~~when a current AU not being a first AU in a decoding order, the fourth second~~ variable is indicative of ~~a current AU not being a first AU in a decoding order and a previous AU~~ in the decoding order comprising (i) the second identifier that is equal to zero and (ii) at least one a picture that is not a ~~random access skipped leading (RASL)~~ picture or a ~~random access decodable leading (RADL)~~ picture and for which the second flag is equal to zero.

10. ~~The method of claim 9, wherein the identifier is a temporal identifier.~~

~~117.~~ The method of claim ~~96~~, wherein the third first variable is notDiscardableAu, and the fourth second variable is prevNonDiscardableAu, the flag is ph_non_ref_pic_flag, and the identifier is TemporalId.

8. ~~The method of claim 1, 12. A method of video processing, comprising:~~

~~—performing a conversion between a video comprising one or more pictures and a bitstream of the video,~~

~~—wherein the bitstream conforms to a format rule,~~

~~—wherein the format rule specifies that a derivation of a firstfifth variable and a secondsixth variable associated with a first picture and a second picture is based on at the second flag,~~

wherein the first picture is a current picture and the second picture is a previous picture in a decoding order that (i) comprises ~~a the second first~~ identifier that is equal to zero, (ii) comprises ~~the second flaga flag~~ that is equal to zero, and (iii) is not a ~~random access skipped leading (RASL)~~ picture or a ~~random access decodable leading (RADL)~~ picture, and

wherein the fifth first variable and the sixth second variable are a maximum value and a minimum value, respectively, of a picture order count of each of the following pictures with a ~~secondthe first~~ identifier that is equal to that of the first picture: (i) the first picture, (ii) the second picture, (iii) one or more short-term reference pictures referred to by all entries in reference picture lists of the first picture, and (iv) each picture that has been output with a coded picture buffer (CPB) removal time less than the CPB removal time of the first picture and a decoded picture buffer (DPB) output time greater than or equal to the CPB removal time of the first picture.

139. The method of claim 128, wherein the fifth ~~first~~-variable is maxPicOrderCnt and indicates the maximum value of the picture order count and the sixth ~~second~~-variable is minPicOrderCnt and indicates the minimum value of the picture order count.

~~14. The method of claim 12, wherein the flag indicates whether the current picture is allowed to be used as a reference picture.~~

~~15. The method of claim 12, wherein the first identifier is a temporal identifier and the second identifier is an identifier of a layer.~~

~~16. The method of any of claims 12 to 15, wherein the first variable is maxPicOrderCnt, the second variable is minPicOrderCnt, the first identifier is TemporalId, the second identifier is nuh_layer_id, and the flag is ph_non_ref_pic_flag.~~

~~17~~10. The method of any of claims 1 to ~~16~~9, wherein the conversion comprises decoding the video from the bitstream.

118. The method of any of claims 1 to ~~16~~9, wherein the conversion comprises encoding the video into the bitstream.

~~19. A method of storing a bitstream representing a video to a computer-readable recording medium, comprising:~~

~~—generating the bitstream from the video according to a method described in any one or more of claims 1 to 16; and~~

~~—storing the bitstream in the computer-readable recording medium.~~

~~20. A video processing apparatus comprising a processor configured to implement a method recited in any one or more of claims 1 to 19.~~

~~21. A computer-readable medium having instructions stored thereon, the instructions, when executed, causing a processor to implement a method recited in one or more of claims 1 to 19.~~

~~22. A computer-readable medium that stores the bitstream generated according to any one or more of claims 1 to 19.~~

2312. An video processing 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: for storing a bitstream, wherein the video processing apparatus is configured to implement a method recited in any one or more of claims 1 to 19.

_____ perform a conversion between a video comprising one or more pictures and a bitstream of the video,

_____ wherein the bitstream conforms to a format rule,

_____ wherein the format rule specifies that a derivation of a previous picture in a semantics associated with a first flag and in a decoding process for a picture order count is based on a second flag,

_____ wherein the previous picture is a previous picture in a decoding order that has (i) a first identifier that is the same as a slice or picture header referring to a reference picture list syntax structure, (ii) a second identifier and the second flag being both equal to zero, and (iii) a picture type different from a random access skipped leading (RASL) picture and a random access decodable leading (RADL) picture,

_____ wherein the first flag indicates whether a third flag is present in the bitstream,

_____ wherein the second flag indicates whether a current picture is allowed to be used as a reference picture, and

_____ wherein the third flag is used to determine a first variable associated with a picture order count value of a long-term reference picture.

13. The apparatus of claim 12, wherein the first identifier is an identifier of a layer and is a syntax element nuh_layer_id, and the second identifier is a temporal identifier and is a variable TemporalId,

_____ wherein the first flag is delta_poc_msb_cycle_present_flag, the second flag is ph_non_ref_pic_flag, and wherein the second flag equaling one specifies that the current picture is never used as the reference picture, and the second flag equaling zero specifies that the current picture is allowed to be or not to be used as the reference picture.

14. The apparatus of claim 12, wherein the format rule specifies that a second variable prevNonDiscardableAu, which is used to determine a timing of a removal of a decoding unit (DU) or a decoding of the DU, is access unit (AU) specific, and is derived based on the second flag.

15. The apparatus of claim 12, wherein the format rule specifies that a buffering period (BF) supplemental enhancement information (SEI) message and a picture timing SEI message, when included in the bitstream, are access unit (AU) specific,

wherein a third variable associated with the buffering period SEI message and a fourth variable associated with the buffering period SEI message and the picture timing SEI message are derived based on the second flag,

wherein the third variable is indicative of an AU comprising (i) the second identifier of the AU that is equal to zero and (ii) at least one picture that is not a RASL picture or a RADL picture and for which the second flag is equal to zero,

wherein when a current AU not being a first AU in a decoding order, the fourth variable is indicative of a previous AU in the decoding order comprising (i) the second identifier that is equal to zero and (ii) at least one picture that is not a RASL picture or a RADL picture and for which the second flag is equal to zero, and

wherein the third variable is notDiscardableAu, and the fourth variable is prevNonDiscardableAu.

16. The apparatus of claim 12, wherein the format rule specifies that a derivation of a fifth variable and a sixth variable associated with a first picture and a second picture is based on the second flag,

wherein the first picture is a current picture and the second picture is a previous picture in a decoding order that (i) comprises the second identifier that is equal to zero, (ii) comprises the second flag that is equal to zero, and (iii) is not a RASL picture or a RADL picture,

wherein the fifth variable and the sixth variable are a maximum value and a minimum value, respectively, of a picture order count of each of the following pictures with the first identifier that is equal to that of the first picture: (i) the first picture, (ii) the second picture, (iii) one or more short-term reference pictures referred to by all entries in reference picture lists of the first picture, and (iv) each picture that has been output with a coded picture buffer (CPB) removal time less than

the CPB removal time of the first picture and a decoded picture buffer (DPB) output time greater than or equal to the CPB removal time of the first picture, and

wherein the fifth variable is maxPicOrderCnt and indicates the maximum value of the picture order count and the sixth variable is minPicOrderCnt and indicates the minimum value of the picture order count.

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,

wherein the bitstream conforms to a format rule,

wherein the format rule specifies that a derivation of a previous picture in a semantics associated with a first flag and in a decoding process for a picture order count is based on a second flag,

wherein the previous picture is a previous picture in a decoding order that has (i) a first identifier that is the same as a slice or picture header referring to a reference picture list syntax structure, (ii) a second identifier and the second flag being both equal to zero, and (iii) a picture type different from a random access skipped leading (RASL) picture and a random access decodable leading (RADL) picture,

wherein the first flag indicates whether a third flag is present in the bitstream,

wherein the second flag indicates whether a current picture is allowed to be used as a reference picture, and

wherein the third flag is used to determine a first variable associated with a picture order count value of a long-term reference picture.

18. The non-transitory computer-readable storage medium of claim 17, wherein the format rule specifies that a second variable prevNonDiscardableAu, which is used to determine a timing of a removal of a decoding unit (DU) or a decoding of the DU, is access unit (AU) specific, and is derived based on the second flag,

wherein the format rule specifies that a buffering period (BF) supplemental enhancement information (SEI) message and a picture timing SEI message, when included in the bitstream, are access unit (AU) specific,

wherein a third variable associated with the buffering period SEI message and a fourth variable associated with the buffering period SEI message and the picture timing SEI message are derived based on the second flag,

wherein the third variable is indicative of an AU comprising (i) the second identifier of the AU that is equal to zero and (ii) at least one picture that is not a RASL picture or a RADL picture and for which the second flag is equal to zero,

wherein when a current AU not being a first AU in a decoding order, the fourth variable is indicative of a previous AU in the decoding order comprising (i) the second identifier that is equal to zero and (ii) at least one picture that is not a RASL picture or a RADL picture and for which the second flag is equal to zero,

wherein the third variable is notDiscardableAu, and the fourth variable is prevNonDiscardableAu,

wherein the format rule specifies that a derivation of a fifth variable and a sixth variable associated with a first picture and a second picture is based on the second flag,

wherein the first picture is a current picture and the second picture is a previous picture in a decoding order that (i) comprises the second identifier that is equal to zero, (ii) comprises the second flag that is equal to zero, and (iii) is not a RASL picture or a RADL picture,

wherein the fifth variable and the sixth variable are a maximum value and a minimum value, respectively, of a picture order count of each of the following pictures with the first identifier that is equal to that of the first picture: (i) the first picture, (ii) the second picture, (iii) one or more short-term reference pictures referred to by all entries in reference picture lists of the first picture, and (iv) each picture that has been output with a coded picture buffer (CPB) removal time less than the CPB removal time of the first picture and a decoded picture buffer (DPB) output time greater than or equal to the CPB removal time of the first picture, and

wherein the fifth variable is maxPicOrderCnt and indicates the maximum value of the picture order count and the sixth variable is minPicOrderCnt and indicates the minimum value of the picture order count.

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,

wherein the bitstream conforms to a format rule,

wherein the format rule specifies that a derivation of a previous picture in a semantics associated with a first flag and in a decoding process for a picture order count is based on a second flag,

wherein the previous picture is a previous picture in a decoding order that has (i) a first identifier that is the same as a slice or picture header referring to a reference picture list syntax structure, (ii) a second identifier and the second flag being both equal to zero, and (iii) a picture type different from a random access skipped leading (RASL) picture and a random access decodable leading (RADL) picture,

wherein the first flag indicates whether a third flag is present in the bitstream,

wherein the second flag indicates whether a current picture is allowed to be used as a reference picture, and

wherein the third flag is used to determine a first variable associated with a picture order count value of a long-term reference picture.

20. The non-transitory computer-readable recording medium of claim 19, wherein the format rule specifies that a second variable prevNonDiscardableAu, which is used to determine a timing of a removal of a decoding unit (DU) or a decoding of the DU, is access unit (AU) specific, and is derived based on the second flag,

wherein the format rule specifies that a buffering period (BF) supplemental enhancement information (SEI) message and a picture timing SEI message, when included in the bitstream, are access unit (AU) specific,

wherein a third variable associated with the buffering period SEI message and a fourth variable associated with the picture timing SEI message are derived based on the second flag,

wherein the third variable is indicative of an AU comprising (i) the second identifier of the AU that is equal to zero and (ii) at least one picture that is not a RASL picture or a RADL picture and for which the second flag is equal to zero,

wherein when a current AU not being a first AU in a decoding order, the fourth variable is indicative of a previous AU in the decoding order comprising (i) the second identifier that is equal to zero and (ii) at least one picture that is not a RASL picture or a RADL picture and for which the second flag is equal to zero,

wherein the third variable is notDiscardableAu, and the fourth variable is prevNonDiscardableAu,

wherein the format rule specifies that a derivation of a fifth variable and a sixth variable associated with a first picture and a second picture is based on the second flag,

wherein the first picture is a current picture and the second picture is a previous picture in a decoding order that (i) comprises the second identifier that is equal to zero, (ii) comprises the second flag that is equal to zero, and (iii) is not a RASL picture or a RADL picture,

wherein the fifth variable and the sixth variable are a maximum value and a minimum value, respectively, of a picture order count of each of the following pictures with the first identifier that is equal to that of the first picture: (i) the first picture, (ii) the second picture, (iii) one or more short-term reference pictures referred to by all entries in reference picture lists of the first picture, and (iv) each picture that has been output with a coded picture buffer (CPB) removal time less than the CPB removal time of the first picture and a decoded picture buffer (DPB) output time greater than or equal to the CPB removal time of the first picture, and

wherein the fifth variable is maxPicOrderCnt and indicates the maximum value of the picture order count and the sixth variable is minPicOrderCnt and indicates the minimum value of the picture order count.