SUBPICTURE LEVEL INFORMATION SIGNALING IN VIDEO CODING

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application is based on International Patent Application No. PCT/US2021/036349, filed on June 08, 2021 which claims the priority to and benefits of U.S. Provisional Patent Application No. 63/036,743, filed on June 09, 2020. All the aforementioned patent applications are hereby incorporated by reference in their entireties.~~Under the applicable patent law and/or rules pursuant to the Paris Convention, this application is made to timely claim the priority to and benefits of U.S. Provisional Patent Application No. 63/036,743, filed on June 9, 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.~~

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 a video or an image.

[005] In one example aspect, a video processing method is disclosed. The method includes performing a conversion between a video comprising one or more subpictures and a bitstream of the video, wherein one or more supplemental enhancement information messages that have filler payloads are processed during the conversion according to a format rule, and wherein the format rule disallows the one or more supplemental enhancement information messages having filler payloads to be in a scalable nesting supplemental enhancement information message.

[006] In another example aspect, a video processing method is disclosed. The method includes performing a conversion between a video and a bitstream of the video, wherein one or more syntax elements are processed during the conversion according to a format rule, and wherein the format rule specifies that the one or more syntax elements are used for indicating subpicture information for layers of the video that have pictures with multiple subpictures.

CLAIMS

1. A method of processing video data, comprising:

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

wherein the format rule specifies that a first syntax element in a scalable nesting supplemental enhancement information message in the bitstream is set to a particular value in response to the scalable nesting supplemental enhancement information message including one or more subpicture level information supplemental enhancement information messages, and

wherein the particular value of the first syntax element indicates that the scalable nesting supplemental enhancement information message includes one or more scalable-nested supplemental enhancement information messages that apply to a specific output video layer set.

2. The method of claim 1,

wherein the format rule that specifies that a value of a second syntax element in the bitstream is equal to 0 in response to the scalable nesting supplemental enhancement information message including the one or more subpicture level information supplemental enhancement information messages, and

wherein the value of the second syntax element being equal to 0 specifies that the scalable nesting supplemental enhancement information message includes the one or more scalable-nested supplemental enhancement information messages that apply to one or more output video layer sets or one or more video layers apply to all subpictures of the one or more output video layer sets or the one or more video layers.

3. The method of any of claims 1 to 2,

wherein the format rule specifies that a payload type of the one or more scalable nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message is 203, and

wherein a payload type of 203 for a supplemental enhancement information message indicates that the supplemental enhancement information message is a subpicture level information supplemental enhancement information message.

1. A method of processing video data, comprising:

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

wherein the format rule specifies that a first syntax element in a scalable nesting supplemental enhancement information message in the bitstream is set to a particular value in response to the scalable nesting supplemental enhancement information message including one or more subpicture level information supplemental enhancement information messages, and

wherein the particular value of the first syntax element indicates that one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message apply to a specific output video layer set.

2. The method of claim 1,

wherein the format rule specifies that a value of a second syntax element in the bitstream is equal to 0 in response to the scalable nesting supplemental enhancement information message including the one or more subpicture level information supplemental enhancement information messages, and

wherein the value of the second syntax element being equal to 0 specifies that the one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message that apply to specified one or more output video layer sets or specified one or more video layers apply to all subpictures of the specified one or more output video layer sets or the specified one or more video layers.

3. The method of claim 1 or 2,

wherein a payload type of 203 for a supplemental enhancement information message indicates that the supplemental enhancement information message is the subpicture level information supplemental enhancement information message.

4. The method of any one of claims 1~3, wherein the particular value of the first syntax element is equal to 1.

4. The method of any of claims 1 to 3, wherein the particular value of the first syntax element is equal to 1.

5. A method of processing video data, comprising:

performing a conversion between a video comprising a plurality of subpictures and a bitstream of the video,

wherein the conversion is according to a format rule that specifies that a scalable nesting supplemental enhancement information message is disallowed from including a first supplemental enhancement information message of a first payload type and a second supplemental enhancement information message of a second payload type.

6. The method of claim 5, wherein the first payload type includes a payload type of a buffering period supplemental enhancement information message.

7. The method of claim 5, wherein the first payload type includes a payload type of a picture timing supplemental enhancement information message.

8. The method of claim 5, wherein the first payload type includes a payload type of a decoding unit information supplemental enhancement information message.

9. The method of claim 5, wherein the first payload type includes a payload type of a subpicture level information supplemental enhancement information message.

10. The method of claim 5, wherein the second payload type includes a payload type that is not one of the following:

(i) the payload type of a buffering period supplemental enhancement information message,

(ii) the payload type of a picture timing supplemental enhancement information message,

(iii) the payload type of a decoding unit information supplemental enhancement information message, and

5. The method of any one of claims 1~4, wherein the format rule specifies that the scalable nesting supplemental enhancement information message is disallowed from including a first supplemental enhancement information message of a first payload type and a second supplemental enhancement information message of a second payload type,

wherein the first payload type includes a payload type of a buffering period supplemental enhancement information message, a payload type of a picture timing supplemental enhancement information message, a payload type of a decoding unit information supplemental enhancement information message, or a payload type of a subpicture level information supplemental enhancement information message, and

wherein the second payload type includes a payload type that is not one of the following: (i) the payload type of the buffering period supplemental enhancement information message, (ii) the payload type of the picture timing supplemental enhancement information message, (iii) the payload type of the decoding unit information supplemental enhancement information message, and (iv) the payload type of the subpicture level information supplemental enhancement information message.

6. The method of any one of claims 1~5, wherein the performing the conversion comprises encoding the video into the bitstream.

7. The method of any one of claims 1~5, wherein the performing the conversion comprises decoding the video from the bitstream.

8. 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 subpictures and a bitstream of the video according to a format rule,

wherein the format rule specifies that a first syntax element in a scalable nesting supplemental enhancement information message in the bitstream is set to a particular value in response to the scalable nesting supplemental enhancement information message including one or more subpicture level information supplemental enhancement information messages, and

(iv) the payload type of a subpicture level information supplemental enhancement information message.

11. The method of any of claims 1 to 10, wherein the performing the conversion comprising encoding the video into the bitstream.

12. The method of any of claims 1 to 10, wherein the performing the conversion comprises generating the bitstream from the video, and the method further comprises storing the bitstream in a non-transitory computer-readable recording medium.

13. The method of any of claims 1 to 10, wherein the performing the conversion comprises decoding the video from the bitstream.

14. A video decoding apparatus comprising a processor configured to implement a method recited in one or more of claims 1 to 13.

15. A video encoding apparatus comprising a processor configured to implement a method recited in one or more of claims 1 to 13.

16. A computer program product having computer instructions stored thereon, the instructions, when executed by a processor, causes the processor to implement a method recited in any of claims 1 to 13.

17. A non-transitory computer-readable storage medium that stores a bitstream generated according to the method in any one of claims 1 to 13.

18. A non-transitory computer-readable storage medium storing instructions that cause a processor to implement a method recited in any of claims 1 to 13.

19. A method of bitstream generation, comprising:

wherein the particular value of the first syntax element indicates that one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message apply to a specific output video layer set.

9. The apparatus of claim 8,

wherein the format rule specifies that a value of a second syntax element in the bitstream is equal to 0 in response to the scalable nesting supplemental enhancement information message including the one or more subpicture level information supplemental enhancement information messages, and

wherein the value of the second syntax element being equal to 0 specifies that the one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message that apply to specified one or more output video layer sets or specified one or more video layers apply to all subpictures of the specified one or more output video layer sets or the specified one or more video layers.

10. The apparatus of claim 8 or 9,

wherein a payload type of 203 for a supplemental enhancement information message indicates that the supplemental enhancement information message is the subpicture level information supplemental enhancement information message.

11. The apparatus of any one of claims 8~10, wherein the particular value of the first syntax element is equal to 1.

12. The apparatus of any one of claims 8~11, wherein the format rule specifies that the scalable nesting supplemental enhancement information message is disallowed from including a first supplemental enhancement information message of a first payload type and a second supplemental enhancement information message of a second payload type,

wherein the first payload type includes a payload type of a buffering period supplemental enhancement information message, a payload type of a picture timing supplemental enhancement information message, a payload type of a decoding unit information supplemental enhancement

~~generating a bitstream of a video according to a method recited in any of claims 1 to 13, and~~

~~storing the bitstream on a computer-readable program medium.~~

~~20. A method, an apparatus, a bitstream generated according to a disclosed method or a system described in the present document.~~

information message, or a payload type of a subpicture level information supplemental enhancement information message, and

wherein the second payload type includes a payload type that is not one of the following: (i) the payload type of the buffering period supplemental enhancement information message, (ii) the payload type of the picture timing supplemental enhancement information message, (iii) the payload type of the decoding unit information supplemental enhancement information message, and (iv) the payload type of the subpicture level information supplemental enhancement information message.

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

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

wherein the format rule specifies that a first syntax element in a scalable nesting supplemental enhancement information message in the bitstream is set to a particular value in response to the scalable nesting supplemental enhancement information message including one or more subpicture level information supplemental enhancement information messages, and

wherein the particular value of the first syntax element indicates that one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message apply to a specific output video layer set.

14. The non-transitory computer-readable storage medium of claim 13,

wherein the format rule specifies that a value of a second syntax element in the bitstream is equal to 0 in response to the scalable nesting supplemental enhancement information message including the one or more subpicture level information supplemental enhancement information messages, and

wherein the value of the second syntax element being equal to 0 specifies that the one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message that apply to specified one or more output video layer sets or specified one or more video layers apply to all subpictures of the specified one or

more output video layer sets or the specified one or more video layers.

15. The non-transitory computer-readable storage medium of claim 13 or 14, wherein the particular value of the first syntax element is equal to 1.

16. The non-transitory computer-readable storage medium of any one of claims 13~15, wherein the format rule specifies that the scalable nesting supplemental enhancement information message is disallowed from including a first supplemental enhancement information message of a first payload type and a second supplemental enhancement information message of a second payload type,

wherein the first payload type includes a payload type of a buffering period supplemental enhancement information message, a payload type of a picture timing supplemental enhancement information message, a payload type of a decoding unit information supplemental enhancement information message, or a payload type of a subpicture level information supplemental enhancement information message, and

wherein the second payload type includes a payload type that is not one of the following: (i) the payload type of the buffering period supplemental enhancement information message, (ii) the payload type of the picture timing supplemental enhancement information message, (iii) the payload type of the decoding unit information supplemental enhancement information message, and (iv) the payload type of the subpicture level information supplemental enhancement information message.

17. 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 subpictures according to a format rule,

wherein the format rule specifies that a first syntax element in a scalable nesting supplemental enhancement information message in the bitstream is set to a particular value in response to the scalable nesting supplemental enhancement information message including one or more subpicture level information supplemental enhancement information messages, and

wherein the particular value of the first syntax element indicates that one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message apply to a specific output video layer set.

18. The non-transitory computer-readable recording medium of claim 17,

wherein the format rule specifies that a value of a second syntax element in the bitstream is equal to 0 in response to the scalable nesting supplemental enhancement information message including the one or more subpicture level information supplemental enhancement information messages, and

wherein the value of the second syntax element being equal to 0 specifies that the one or more scalable-nested supplemental enhancement information messages in the scalable nesting supplemental enhancement information message that apply to specified one or more output video layer sets or specified one or more video layers apply to all subpictures of the specified one or more output video layer sets or the specified one or more video layers.

19. The non-transitory computer-readable recording medium of claim 17 or 18, wherein the particular value of the first syntax element is equal to 1.

20. The non-transitory computer-readable recording medium of any one of claims 17~19, wherein the format rule specifies that the scalable nesting supplemental enhancement information message is disallowed from including a first supplemental enhancement information message of a first payload type and a second supplemental enhancement information message of a second payload type,

wherein the first payload type includes a payload type of a buffering period supplemental enhancement information message, a payload type of a picture timing supplemental enhancement information message, a payload type of a decoding unit information supplemental enhancement information message, or a payload type of a subpicture level information supplemental enhancement information message, and

wherein the second payload type includes a payload type that is not one of the following:

(i) the payload type of the buffering period supplemental enhancement information message, (ii) the payload type of the picture timing supplemental enhancement information

message, (iii) the payload type of the decoding unit information supplemental enhancement information message, and (iv) the payload type of the subpicture level information supplemental enhancement information message.