CLAIMS

1. A method of processing video data, comprising:

performing a conversion between a video including one or more layers and a bitstream of the video according to a rule,

wherein the rule specifies a sub-bitstream extraction process by which network abstraction layer (NAL) units are removed from an input bitstream to the sub-bitstream extraction process to generate an output sub-bitstream, and

wherein the rule further specifies that when a list of NAL unit header layer identifier values in an output layer set (OLS) with a target OLS index does not include all values of NAL unit header layer identifiers in all video coding layer (VCL) NAL units in the input bitstream, and when the output sub-bitstream contains a first supplemental enhancement information (SEI) NAL unit that contains a particular scalable nesting SEI message, a new SEI NAL unit is generated, and scalable-nested SEI messages are extracted from the particular scalable nesting SEI message and included in the new SEI NAL unit.

2. The method of claim 1, wherein the particular scalable nesting SEI message is a scalable nesting SEI message with a first flag equal to a first value and a second flag equal to a second value that applies to the OLS with the target OLS index,

wherein the first flag equal to the first value indicates that the scalable nesting SEI message applies to specific output layer sets (OLSs), and

wherein the second flag equal to the second value indicates that the scalable nesting SEI message applies to all subpictures.

3. The method of claim 1 or 2, wherein the scalable-nested SEI messages are included in the new SEI NAL unit as non-scalable-nested SEI messages.

4. The method of any one of claims 1-3, wherein the new SEI NAL unit is included in a picture unit (PU) containing the first SEI NAL unit.

5. The method of claim 4, wherein the new SEI NAL unit is included immediately after the first SEI NAL unit.

6. The method of any one of claims 1-5, wherein the first SEI NAL unit is removed from the output sub-bitstream after the scalable-nested SEI messages being included in the new SEI NAL unit.

7. The method of any one of claims 1-6, wherein the conversion includes encoding the video into the bitstream.

8. The method of any one of claims 1-6, wherein the conversion includes decoding the video from the bitstream.

9. 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 including one or more layers and a bitstream of the video according to a rule,

wherein the rule specifies a sub-bitstream extraction process by which network abstraction layer (NAL) units are removed from an input bitstream to the sub-bitstream extraction process to generate an output sub-bitstream, and

wherein the rule further specifies that when a list of NAL unit header layer identifier values in an output layer set (OLS) with a target OLS index does not include all values of NAL unit header layer identifiers in all video coding layer (VCL) NAL units in the input bitstream, and when the output sub-bitstream contains a first supplemental enhancement information (SEI) NAL unit that contains a particular scalable nesting SEI message, a new SEI NAL unit is generated, and scalable-nested SEI messages are extracted from the particular scalable nesting SEI message and included in the new SEI NAL unit.

10. The apparatus of claim 9, wherein the particular scalable nesting SEI message is a scalable nesting SEI message with a first flag equal to a first value and a second flag equal to a second value that applies to the OLS with the target OLS index,

wherein the first flag equal to the first value indicates that the scalable nesting SEI message applies to specific output layer sets (OLSs), and

wherein the second flag equal to the second value indicates that the scalable nesting SEI message applies to all subpictures.

11. The apparatus of claim 9 or 10, wherein the scalable-nested SEI messages are included in the new SEI NAL unit as non-scalable-nested SEI messages.

12. The apparatus of any one of claims 9-11, wherein the new SEI NAL unit is included in a picture unit (PU) containing the first SEI NAL unit, wherein the new SEI NAL unit is included immediately after the first SEI NAL unit, and wherein the first SEI NAL unit is removed from the output sub-bitstream after the scalable-nested SEI messages being included in the new SEI NAL unit.

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

perform a conversion between a video including one or more layers and a bitstream of the video according to a rule,

wherein the rule specifies a sub-bitstream extraction process by which network abstraction layer (NAL) units are removed from an input bitstream to the sub-bitstream extraction process to generate an output sub-bitstream, and

wherein the rule further specifies that when a list of NAL unit header layer identifier values in an output layer set (OLS) with a target OLS index does not include all values of NAL unit header layer identifiers in all video coding layer (VCL) NAL units in the input bitstream, and when the output sub-bitstream contains a first supplemental enhancement information (SEI) NAL unit that contains a particular scalable nesting SEI message, a new SEI NAL unit is generated, and scalable-nested SEI messages are extracted from the particular scalable nesting SEI message and included in the new SEI NAL unit.

14. The non-transitory computer-readable storage medium of claim 13, wherein the particular scalable nesting SEI message is a scalable nesting SEI message with a first flag equal to a first value and a second flag equal to a second value that applies to the OLS with the target OLS index,

wherein the first flag equal to the first value indicates that the scalable nesting SEI message applies to specific output layer sets (OLSs), and

wherein the second flag equal to the second value indicates that the scalable nesting SEI message applies to all subpictures.

15. The non-transitory computer-readable storage medium of claim 13 or 14, wherein the scalable-nested SEI messages are included in the new SEI NAL unit as non-scalable-nested SEI messages.

16. The non-transitory computer-readable storage medium of any one of claims 13-15, wherein the new SEI NAL unit is included in a picture unit (PU) containing the first SEI NAL unit, wherein the new SEI NAL unit is included immediately after the first SEI NAL unit, and wherein the first SEI NAL unit is removed from the output sub-bitstream after the scalable-nested SEI messages being included in the new SEI NAL unit.

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 including one or more layers according to a rule,

wherein the rule specifies a sub-bitstream extraction process by which network abstraction layer (NAL) units are removed from an input bitstream to the sub-bitstream extraction process to generate an output sub-bitstream, and

wherein the rule further specifies that when a list of NAL unit header layer identifier values in an output layer set (OLS) with a target OLS index does not include all values of NAL unit header layer identifiers in all video coding layer (VCL) NAL units in the input bitstream, and when the output sub-bitstream contains a first supplemental enhancement information (SEI)

NAL unit that contains a particular scalable nesting SEI message, a new SEI NAL unit is generated, and scalable-nested SEI messages are extracted from the particular scalable nesting SEI message and included in the new SEI NAL unit.

18. The non-transitory computer-readable recording medium of claim 17, wherein the particular scalable nesting SEI message is a scalable nesting SEI message with a first flag equal to a first value and a second flag equal to a second value that applies to the OLS with the target OLS index,

wherein the first flag equal to the first value indicates that the scalable nesting SEI message applies to specific output layer sets (OLSs), and

wherein the second flag equal to the second value indicates that the scalable nesting SEI message applies to all subpictures.

19. The non-transitory computer-readable recording medium of claim 17 or 18, wherein the scalable-nested SEI messages are included in the new SEI NAL unit as non-scalable-nested SEI messages.

20. The non-transitory computer-readable recording medium of any one of claims 17-19, wherein the new SEI NAL unit is included in a picture unit (PU) containing the first SEI NAL unit, wherein the new SEI NAL unit is included immediately after the first SEI NAL unit, and wherein the first SEI NAL unit is removed from the output sub-bitstream after the scalable-nested SEI messages being included in the new SEI NAL unit.

~~1. A method of processing video data, comprising:~~

~~performing a conversion between a video and a bitstream of the video according to a rule,~~

~~wherein the bitstream includes network abstraction layer (NAL) units for multiple video layers according to a rule;~~

~~wherein the rule defines that a sub-bitstream extraction process to generate an output bitstream comprising an output layer set (OLS) includes one or more operations that are selectively performed responsive to the following conditions: (1) a list of NAL unit header layer identifier values in the OLS does not includes all values of NAL unit header layer identifiers in~~

all video coding layer (VCL) NAL units in the bitstream, and (2) the output bitstream containing a supplemental enhancement information (SEI) NAL unit that contains a scalable-nesting SEI message.

2. The method of claim 1, wherein the scalable-nesting SEI message is associated with a first flag equal to a particular value that applies to specific OLSs or specific layers that have a same set of layers as in the output bitstream.

3. The method of claim 2, wherein the first flag equal to 0 specifies that scalable-nested SEI messages that apply to the specific OLSs or the specific layers apply to all subpictures of the specified OLSs or the specific layers.

4. The method of claim 1, wherein the scalable-nesting SEI message is associated with a second flag indicative of whether the scalable-nesting SEI message applies to specific OLSs or specific layers.

5. The method of any of claims 1-4, wherein the one or more operations include generating an additional SEI NAL unit.

6. The method of claim 5, wherein the one or more operations include including the additional SEI NAL unit in a picture unit containing the SEI NAL unit.

7. The method of claim 6, wherein the additional SEI NAL unit is immediately after the SEI NAL unit.

8. The method of any of claim 6, wherein the one or more operations further include extracting scalable-nested SEI messages from the scalable-nesting SEI message and including the scalable-nested SEI messages in the additional SEI NAL unit.

9. The method of claim 1, wherein the one or more operations include removing the SEI NAL unit from the output bitstream.

10. The method of claim 1, wherein the one or more operations include keeping the SEI NAL unit in the output bitstream.

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

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

13. The method of any of claims 1 to 10, 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.

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

15. A method of storing a bitstream of a video, comprising, a method recited in any one of claims 1 to 13, and further including storing the bitstream to a non-transitory computer-readable recording medium.

16. 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 13.

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

18. A video processing apparatus 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 13.