SCALING WINDOW IN SUBPICTURE SUB-BITSTREAM EXTRACTION PROCESS

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application is a national phase of International Application No. PCT/CN2021/095179, filed on May 21, 2021, which claims the priority to and benefits of International Patent Application No. PCT/CN2020/091696, filed on May 22, 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 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 comprising one or more video pictures comprising one or more subpictures and a bitstream of the video, wherein the conversion conforms to a rule that specifies that one or more parameters for a scaling window applicable to a subpicture are determined from one or more syntax elements during a subpicture sub-bitstream extraction process.

[006] In another example aspect, another video processing method is disclosed. The method includes performing a conversion between a video comprising one or more layers comprising one or more video pictures comprising one or more subpictures and a bitstream of the video according to a rule, wherein the rule defines network abstraction layer (NAL) units to be

CLAIMS

1. A method of video processing, comprising:

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

wherein the bitstream conforms to a rule that specifies that, during a subpicture sub-bitstream extraction process, one or more parameters for a scaling window applicable to a subpicture are determined by rewriting values of one or more syntax elements included in the bitstream for a scaling window applicable to a video picture.

2. The method of claim 1, wherein the one or more parameters comprises at least one of a left offset, a right offset, a top offset or a bottom offset of the scaling window applicable to the subpicture.

3. The method of claim 1, wherein the one or more syntax elements comprises a first set of syntax elements included in one or more picture parameter set (PPS) and a second set of syntax elements included in one or more sequence parameter set (SPS), and

wherein values of the first set of syntax elements in one or more referenced PPS NAL units are rewritten by a calculation using original values of the first set of syntax elements from original one or more PPS before they were rewritten and original values of the second set of syntax elements from original one or more SPS before they were rewritten, and

wherein the one or more parameters for the scaling window applicable to the subpicture are indicated by rewritten values of the first set of syntax elements.

4. The method of claim 3, wherein the first set of syntax elements comprises at least one of :

pps_scaling_win_left_offset, pps_scaling_win_right_offset, pps_scaling_win_top_offset, pps_scaling_win_bottom_offset; and

wherein the second set of syntax elements comprises at least one of:

sps_subpic_ctu_top_left_x[spIdx], sps_subpic_width_minus1[spIdx], sps_subpic_ctu_top_left_y[spIdx], sps_subpic_height_minus1[spIdx], sps_pic_width_max_in_luma_samples, sps_pic_height_max_in_luma_samples.

5. The method of claim 3, wherein the one or more parameters comprises a left offset of the scaling window applicable to the subpicture derived as follows:

subpicScalWinLeftOffset = pps_scaling_win_left_offset − sps_subpic_ctu_top_left_x[spIdx] * CtbSizeY / SubWidthC,

wherein subpicScalWinLeftOffset denotes the left offset of the scaling window applicable to the subpicture,

wherein pps_scaling_win_left_offset indicates original left offset applied to a picture size for scaling ratio calculation,

wherein sps_subpic_ctu_top_left_x[spIdx] indicates an original x-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture,

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit, and

wherein SubWidthC indicates a width of a video block and is obtained from a table according to a chroma format of a video picture including the video block.

6. The method of claim 3, wherein the one or more parameters comprises a right offset of the scaling window derived as follows:

subpicScalWinRightOffset = (rightSubpicBd >= sps_pic_width_max_in_luma_samples) ?

pps_scaling_win_right_offset : pps_scaling_win_right_offset −

(sps_pic_width_max_in_luma_samples − rightSubpicBd) / SubWidthC, and

rightSubpicBd = (sps_subpic_ctu_top_left_x[spIdx] + sps_subpic_width_minus1[spIdx] + 1) * CtbSizeY,

wherein subpicScalWinRightOffset denotes the right offset of the scaling window applicable to the subpicture,

wherein sps_pic_width_max_in_luma_samples specifies an original maximum width, in units of luma samples, of each decoded picture referring to the sequence parameter set,

wherein pps_scaling_win_right_offset indicates an original right offset applied to a picture size for scaling ratio calculation,

wherein SubWidthC indicates a width of a video block and is obtained from a table according to a chroma format of a picture including the video block, and

wherein sps_subpic_ctu_top_left_x[spIdx]indicates an original x-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture,

wherein sps_subpic_width_minus1[spIdx] indicates an original width of the spIdx-th subpicture, and

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit.

7. The method of claim 3, wherein the one or more parameters comprises a top offset of the scaling window derived as follows:

subpicScalWinTopOffset = pps_scaling_win_top_offset −

sps_subpic_ctu_top_left_y[spIdx] * CtbSizeY / SubHeightC,

wherein subpicScalWinTopOffset denotes the top offset of the scaling window applicable to the subpicture,

wherein pps_scaling_win_top_offset indicates an original top offset applied to a picture size for scaling ratio calculation,

wherein sps_subpic_ctu_top_left_y[spIdx]indicates an original y-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture,

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit, and

wherein SubHightC indicates a height of a video block and is obtained from a table according to a chroma format of a picture including the video block.

8. The method of claim 3, wherein the one or more parameters comprises a bottom offset of the scaling window applicable to the subpicture derived as follows:

subpicScalWinBotOffset = (botSubpicBd >= sps_pic_height_max_in_luma_samples) ? pps_scaling_win_bottom_offset : pps_scaling_win_bottom_offset − (sps_pic_height_max_in_luma_samples − botSubpicBd) / SubHeightC, and botSubpicBd = (sps_subpic_ctu_top_left_y[spIdx] +

sps_subpic_height_minus1[spIdx] + 1) * CtbSizeY,

wherein subpicScalWinBotOffset denotes the bottom offset of the scaling window applicable to the subpicture,

wherein sps_pic_height_max_in_luma_samples indicates an original maximum height, in units of luma samples, of each decoded picture referring to the sequence parameter set,

wherein pps_scaling_win_bottom_offset indicates an original bottom offset applied to a picture size for scaling ratio calculation,

wherein SubHeightC indicates a height of a video block and is obtained from a table according to a chroma format of a picture including the video block,

wherein sps_subpic_ctu_top_left_y[spIdx] indicates an original y-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture;

wherein sps_subpic_height_minus1[spIdx] indicates an original height of the spIdx-th subpicture, and

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit.

9. The method of claim 1, wherein the conversion includes encoding the video into the bitstream.

10. The method of claim 1, wherein the conversion includes decoding the video from the bitstream.

11. 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 video pictures comprising one or more subpictures and a bitstream of the video,

wherein the bitstream conforms to a rule that specifies that, during a subpicture sub-bitstream extraction process, one or more parameters for a scaling window applicable to a subpicture are determined by rewriting values of one or more syntax elements included in the bitstream for a scaling window applicable to a video picture.

12. The apparatus of claim 11, wherein the one or more parameters comprises at least one of a left offset, a right offset, a top offset or a bottom offset of the scaling window applicable to the subpicture.

13. The apparatus of claim 11, wherein the one or more syntax elements comprises a first set of syntax elements included in one or more picture parameter set (PPS) and a second set of syntax elements included in one or more sequence parameter set (SPS), and

wherein values of the first set of syntax elements in one or more referenced PPS NAL units are rewritten by a calculation using original values of the first set of syntax elements from original one or more PPS before they were rewritten and original values of the second set of syntax elements from original one or more SPS before they were rewritten, and

wherein the one or more parameters for the scaling window applicable to the subpicture are indicated by rewritten values of the first set of syntax elements.

14. The apparatus of claim 13, wherein the first set of syntax elements comprises at least one of :

pps_scaling_win_left_offset, pps_scaling_win_right_offset, pps_scaling_win_top_offset, pps_scaling_win_bottom_offset; and

wherein the second set of syntax elements comprises at least one of:

sps_subpic_ctu_top_left_x[spIdx], sps_subpic_width_minus1[spIdx], sps_subpic_ctu_top_left_y[spIdx], sps_subpic_height_minus1[spIdx], sps_pic_width_max_in_luma_samples, sps_pic_height_max_in_luma_samples.

15. The apparatus of claim 13, wherein the one or more parameters comprises a left offset of the scaling window applicable to the subpicture derived as follows:
subpicScalWinLeftOffset = pps_scaling_win_left_offset − sps_subpic_ctu_top_left_x[spIdx] * CtbSizeY / SubWidthC,

wherein subpicScalWinLeftOffset denotes the left offset of the scaling window applicable to the subpicture,

wherein pps_scaling_win_left_offset indicates original left offset applied to a picture size for scaling ratio calculation,

wherein sps_subpic_ctu_top_left_x[spIdx] indicates an original x-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture,

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit, and

wherein SubWidthC indicates a width of a video block and is obtained from a table according to a chroma format of a video picture including the video block.

16. The apparatus of claim 13, wherein the one or more parameters comprises a right offset of the scaling window derived as follows:

subpicScalWinRightOffset = (rightSubpicBd >= sps_pic_width_max_in_luma_samples) ?

pps_scaling_win_right_offset : pps_scaling_win_right_offset −

(sps_pic_width_max_in_luma_samples − rightSubpicBd) / SubWidthC, and

rightSubpicBd = (sps_subpic_ctu_top_left_x[spIdx] + sps_subpic_width_minus1[spIdx] + 1) * CtbSizeY,

wherein subpicScalWinRightOffset denotes the right offset of the scaling window applicable to the subpicture,

wherein sps_pic_width_max_in_luma_samples specifies an original maximum width, in units of luma samples, of each decoded picture referring to the sequence parameter set,

wherein pps_scaling_win_right_offset indicates an original right offset applied to a picture size for scaling ratio calculation,

wherein SubWidthC indicates a width of a video block and is obtained from a table according to a chroma format of a picture including the video block, and

wherein sps_subpic_ctu_top_left_x[spIdx]indicates an original x-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture,

wherein sps_subpic_width_minus1[spIdx] indicates an original width of the spIdx-th subpicture, and

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit.

17. The apparatus of claim 13, wherein the one or more parameters comprises a top offset of the scaling window derived as follows:

subpicScalWinTopOffset = pps_scaling_win_top_offset −

sps_subpic_ctu_top_left_y[spIdx] * CtbSizeY / SubHeightC,

wherein subpicScalWinTopOffset denotes the top offset of the scaling window applicable to the subpicture,

wherein pps_scaling_win_top_offset indicates an original top offset applied to a picture size for scaling ratio calculation,

wherein sps_subpic_ctu_top_left_y[spIdx]indicates an original y-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture,

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit, and

wherein SubHightC indicates a height of a video block and is obtained from a table according to a chroma format of a picture including the video block.

18. The apparatus of claim 13, wherein the one or more parameters comprises a bottom offset of the scaling window applicable to the subpicture derived as follows:

subpicScalWinBotOffset = (botSubpicBd >= sps_pic_height_max_in_luma_samples) ? pps_scaling_win_bottom_offset : pps_scaling_win_bottom_offset − (sps_pic_height_max_in_luma_samples − botSubpicBd) / SubHeightC, and botSubpicBd = (sps_subpic_ctu_top_left_y[spIdx] + sps_subpic_height_minus1[spIdx] + 1) * CtbSizeY,

wherein subpicScalWinBotOffset denotes the bottom offset of the scaling window applicable to the subpicture,

wherein sps_pic_height_max_in_luma_samples indicates an original maximum height, in units of luma samples, of each decoded picture referring to the sequence parameter set,

wherein pps_scaling_win_bottom_offset indicates an original bottom offset applied to a picture size for scaling ratio calculation,

wherein SubHeightC indicates a height of a video block and is obtained from a table according to a chroma format of a picture including the video block,

wherein sps_subpic_ctu_top_left_y[spIdx] indicates an original y-coordinate of a coding tree unit located at a top-left corner of the spIdx-th subpicture;

wherein sps_subpic_height_minus1[spIdx] indicates an original height of the spIdx-th subpicture, and

wherein CtbSizeY is a width or a height of a luma coding tree block or coding tree unit.

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 pictures comprising one or more subpictures and a bitstream of the video,

wherein the bitstream conforms to a rule that specifies that, during a subpicture sub-bitstream extraction process, one or more parameters for a scaling window applicable to a subpicture are determined by rewriting values of one or more syntax elements included in the bitstream for a scaling window applicable to a video picture.

20. The non-transitory computer-readable storage medium of claim 19, wherein the one or more parameters comprises at least one of a left offset, a right offset, a top offset or a bottom offset of the scaling window applicable to the subpicture.