HIGH PRECISION TRANSFORM AND QUANTIZATION FOR IMAGE AND VIDEO CODING

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a national phase of International Patent Application No. PCT/CN2020/115533, filed on September 16, 2020, which claims the priority to and benefits of International Patent Application No. PCT/CN2019/107140 filed on September 21, 2019. The entire disclosure of the aforementioned applications is incorporated by reference as part of the disclosure of this application.

TECHNICAL FIELD

[0002] This patent document relates to video coding and decoding.

BACKGROUND

[0003] In spite of the advances in video compression, digital video still 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

[0004] Devices, systems and methods related to digital video coding, and specifically, to video and image coding and decoding in which high precision transform and quantization are used.

[0005] In one example aspect, a video processing method is disclosed. The method includes performing a conversion between a current block of a video and a bitstream representation of the video according to a rule, wherein the rule specifies that a scaling operation of a transform coding mode applied to the current block is configured independently of a size of the current block.

[0006] In another example aspect, a video processing method is disclosed. The method includes performing a conversion between a current block of a video and a bitstream representation of the video according to a rule, wherein the rule specifies that a dequantization process or a scaling operation of a transform coding mode applied to the current block is configured independently of the transform coding mode.

WHAT IS CLAIMED IS:

1. A method of processing video data, comprising:

performing a conversion between a current block of a video and a bitstream of the video, wherein the conversion comprises:

performing, according to a rule, a scaling process for transform coefficients of the current block for deriving scaled transform coefficients of the current block, wherein the rule specifies that in a case where a transformation process for the scaled transform coefficients is to be skipped for the current block, a bit depth shifting variable used in the scaling process is independent of a size of the current block,

wherein a bit depth offset and the bit depth shifting variable are used, before a clip operation, to derive the scaled transform coefficients, and the bit depth offset is derived based on the bit depth shifting variable.

2. The method of claim 1, wherein the bit depth shifting variable bdShift1 is predefined.

3. The method of claim 1 or claim 2, wherein the rule further specifies that in a case where the current block is coded with a block-based differential pulse code modulation (BDPCM) mode, the bit depth shifting variable and the bit depth offset are used in the scaling process.

4. The method of any one of claims 1-3, wherein the bit depth shifting variable and the bit depth offset for a block coded with a block-based differential pulse code modulation (BDPCM) mode is identical to the bit depth shifting variable and the bit depth offset for a block where the transformation process for the scaled transform coefficients is to be skipped.

5. The method of any one of claims 1-4, wherein the rule further specifies that in a case where the current block is coded with a block-based differential pulse code modulation (BDPCM) mode, an explicit scaling matrix is disabled for the scaling process for transform coefficients of the current block.

6. The method of any one of claims 1-5, wherein a flat scaling matrix is used in the scaling process for transform coefficients of the current block.

7. The method of any one of claims 1-6, wherein values of the flat scaling matrix are equal to 16.

8. The method of any one of claims 1-7, wherein the scaling process includes a scaling operation or an inverse scaling operation, and the transformation process includes a transformation operation or an inverse transformation operation.

9. The method of any one of claims 1-8, wherein the conversion includes encoding the current block into the bitstream.

10. The method of any one of claims 1-8, wherein the conversion includes decoding the current block 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 current block of a video and a bitstream of the video, wherein the conversion comprises:

performing, according to a rule, a scaling process for transform coefficients of the current block for deriving scaled transform coefficients of the current block, wherein the rule specifies that in a case where a transformation process for the scaled transform coefficients is to be skipped for the current block, a bit depth shifting variable used in the scaling process is independent of a size of the current block,

wherein a bit depth offset and the bit depth shifting variable are used, before a clip operation, to derive the scaled transform coefficients, and the bit depth offset is derived based on the bit depth shifting variable.

12. The apparatus of claim 11, wherein the bit depth shifting variable bdShift1 is predefined.

13. The apparatus of claim 11 or claim 12, wherein the rule further specifies that in a case where the current block is coded with a block-based differential pulse code modulation (BDPCM) mode, the bit depth shifting variable and the bit depth offset are used in the scaling process.

14. The apparatus of any one of claims 11-13, wherein the bit depth shifting variable and the bit depth offset for a block coded with a block-based differential pulse code modulation (BDPCM) mode is identical to the bit depth shifting variable and the bit depth offset for a block where the transformation process for the scaled transform coefficients is to be skipped.

15. The apparatus any one of claims 11-14, wherein the rule further specifies that in a case where the current block is coded with a block-based differential pulse code modulation (BDPCM) mode, an explicit scaling matrix is disabled for the scaling process for transform coefficients of the current block.

16. The apparatus of any one of claims 11-15, wherein the scaling process includes a scaling operation or an inverse scaling operation, and the transformation process includes a transformation operation or an inverse transformation operation.

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

perform a conversion between a current block of a video and a bitstream of the video, wherein the conversion comprises:

performing, according to a rule, a scaling process for transform coefficients of the current block for deriving scaled transform coefficients of the current block, wherein the rule specifies that in a case where a transformation process for the scaled transform coefficients is to be skipped for the current block, a bit depth shifting variable used in the scaling process is independent of a size of the current block,

wherein a bit depth offset and the bit depth shifting variable are used, before a clip operation, to derive the scaled transform coefficients, and the bit depth offset is derived based on the bit depth shifting variable.

18. The non-transitory computer-readable storage medium of claim 17, wherein the rule further specifies that in a case where the current block is coded with a block-based differential pulse code modulation (BDPCM) mode, the bit depth shifting variable and the bit depth offset are used in the scaling process.

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 from a current block of the video, wherein the generating comprises:

performing, according to a rule, a scaling process for transform coefficients of the current block for deriving scaled transform coefficients of the current block, wherein the rule specifies that in a case where a transformation process for the scaled transform coefficients is to be skipped for the current block, a bit depth shifting variable used in the scaling process is independent of a size of the current block,

wherein a bit depth offset and the bit depth shifting variable are used, before a clip operation, to derive the scaled transform coefficients, and the bit depth offset is derived based on the bit depth shifting variable.

20. The non-transitory computer-readable recording medium of claim 19, wherein the rule further specifies that in a case where the current block is coded with a block-based differential pulse code modulation (BDPCM) mode, the bit depth shifting variable and the bit depth offset are used in the scaling process.