

AN ENCODER, A DECODER AND CORRESPONDING METHODS

TECHNICAL FIELD

[0002] The present disclosure is generally related to video coding, and is specifically related to efficient signaling of coding tool parameters used to compress video data in video coding.

BACKGROUND

[0003] The amount of video data needed to depict even a relatively short video can be substantial, which may result in difficulties when the data is to be streamed or otherwise communicated across a communications network with limited bandwidth capacity. Thus, video data is generally compressed before being communicated across modern day telecommunications networks. The size of a video could also be an issue when the video is stored on a storage device because memory resources may be limited. Video compression devices often use software and/or hardware at the source to code the video data prior to transmission or storage, thereby decreasing the quantity of data needed to represent digital video images. The compressed data is then received at the destination by a video decompression device that decodes the video data. With limited network resources and ever increasing demands of higher video quality, improved compression and decompression techniques that improve compression ratio with little to no sacrifice in image quality are desirable.

CLAIMS

What is claimed is:

1. A method implemented in a decoder, the method comprising:
receiving, by a receiver of the decoder, a bitstream comprising a luma mapping with chroma scaling (LMCS) adaptation parameter set (APS) including LMCS parameters associated with a coded slice, wherein the LMCS APS is referenced by data related to the coded slice;
obtaining LMCS parameters from the LMCS APS associated with the coded slice;
and
decoding, by the processor, the coded slice using LMCS parameters from the LMCS APS.
2. The method of claim 1, wherein the bitstream further comprises a header related to the coded slice, wherein the data related to the coded slice contains an APS identifier (ID) in the header .
3. The method of any of claims 1-2, wherein the bitstream further comprises an adaptive loop filter (ALF) APS containing ALF parameters and a scaling list APS containing APS parameters.
4. The method of any of claims 1-3, wherein each APS includes an APS parameter type (aps_params_type) coded set to a predefined value indicating a type of parameters included in the each APS.
5. The method of any of claims 1-4, wherein each APS includes an APS identifier (ID) selected from a predefined range, and wherein the predefined range is determined based on a parameter type of the each APS.
6. The method of any of claims 1-5, wherein each APS is identified by a combination of a parameter type and an APS ID.
7. The method of any of claims 1-6, wherein the bitstream further comprises a sequence parameter set (SPS) including a flag set to indicate LMCS is enabled for an encoded video

sequence including the coded slice, and wherein the LMCS parameters from the LMCS APS are obtained based on the flag.

8. A method implemented in an encoder, the method comprising:
 - determining, by a processor of the encoder, luma mapping with chroma scaling (LMCS) parameters for a slice;
 - encoding, by the processor, the slice into a bitstream as a coded slice;
 - encoding, by the processor, the LMCS parameters into a LMCS adaptation parameter set (APS) of the bitstream; and
 - encoding into the bitstream, by the processor, data related to the coded slice that references the LMCS APS.
9. The method of claim 8, wherein the data related to the coded slice contains an APS identifier (ID) in a header related to the coded slice.
10. The method of any of claims 8-9, further comprising encoding into the bitstream, by the processor, an adaptive loop filter (ALF) APS containing ALF parameters and a scaling list APS containing APS parameters.
11. The method of any of claims 8-10, wherein each APS includes an APS parameter type (aps_params_type) coded set to a predefined value indicating a type of parameters included in the each APS.
12. The method of any of claims 8-11, wherein each APS includes an APS identifier (ID) selected from a predefined range, and wherein the predefined range is determined based on a parameter type of the each APS.
13. The method of any of claims 8-12, wherein each APS is identified by a combination of a parameter type and an APS ID.
14. The method of any of claims 8-13, further comprising encoding, by the processor, a sequence parameter set (SPS) into the bitstream, wherein the SPS includes a flag set to indicate LMCS is enabled for an encoded video sequence including the coded slice.

15. A video coding device comprising:
a processor, a receiver coupled to the processor, a memory coupled to the processor, and a transmitter coupled to the processor, wherein the processor, receiver, memory, and transmitter are configured to perform the method of any of claims 1-14.
16. A non-transitory computer readable medium comprising a computer program product for use by a video coding device, the computer program product comprising computer executable instructions stored on the non-transitory computer readable medium such that when executed by a processor cause the video coding device to perform the method of any of claims 1-14.
17. A decoder comprising:
a receiving unit, configured to receive a bitstream comprising a luma mapping with chroma scaling (LMCS) adaptation parameter set (APS) including LMCS parameters associated with a coded slice, wherein the LMCS APS is referenced by data related to the coded slice;
a obtaining unit, configured to obtain LMCS parameters from the LMCS APS associated with the coded slice;
a decoding unit, configured to decode the coded slice using LMCS parameters from the LMCS APS.
18. The decoder of claim 17, wherein the decoder is further configured to perform the method of any of claims 1-7.
19. An encoder comprising:
a determining unit, configured to determine luma mapping with chroma scaling (LMCS) parameters for a slice;
an encoding unit, configured to:
encode the slice into a bitstream as a coded slice;
encode the LMCS parameters into a LMCS adaptation parameter set (APS) of the bitstream; and
encode into the bitstream data related to the coded slice that references the LMCS APS.

20. The encoder of claim 19, wherein the encoder is further configured to perform the method of any of claims 8-14.
21. A non-transitory storage medium which includes an encoded bitstream, the bitstream comprising a luma mapping with chroma scaling (LMCS) adaptation parameter set (APS) including LMCS parameters associated with a coded slice, and data related to the coded slice references the LMCS APS.
22. An decoder comprising processing circuitry for carrying out the method according to any one of claims 1 to 7.
23. A encoder comprising processing circuitry for carrying out the method according to any of claims 8 to 14.
24. A computer program product comprising program code for performing the method according to any of claims 1 to 14 when executed on a computer or a processor.
25. A non-transitory computer-readable medium carrying a program code which, when executed by a computer device, causes the computer device to perform the method of any one of claims 1 to 14.