High-Level Syntax Designs for Point Cloud Coding

~~CROSS-REFERENCE TO RELATED APPLICATIONS~~

[0001] ~~This patent application claims the benefit of U.S. Provisional Patent Application No. 62/690,132, filed June 26, 2018, by Ye-Kui Wang, et al., and titled "High-Level Syntax Designs for Point Cloud Coding," which is hereby incorporated by reference.~~

TECHNICAL FIELD

[0002] The present disclosure is generally related to point cloud coding, and is specifically related to the high-level syntax for point cloud coding.

BACKGROUND

[0003] The point cloud is employed in a wide variety of applications including entertainment industry, intelligent automobile navigation, geospatial inspection, three dimensional (3D) modeling of real world objects, visualization etc. Considering the non-uniform sampling geometry of the point cloud, compact representations for storage and transmission of such data is useful. Compared with the other 3D presentations, the irregular point cloud is more general and applicable for a wider range of sensors and data acquisition strategies. For example, when performing a 3D presentation in a virtual reality world or remote renderings in a tele-presence environment, the rendering of virtual figures and real-time instructions are processed as dense point cloud data set.

SUMMARY

[0004] A first aspect relates to a method of method of point cloud coding (PCC) implemented by a video decoder. The method includes receiving an encoded bitstream including a group of frames header disposed outside a coded representation of a texture component or a geometry component and identifying a video codec used for coding the texture component or the geometry component; and decoding the encoded bitstream.

[0005] A second aspect relates to a method of point cloud coding (PCC) implemented by a video encoder. The method includes generating an encoded bitstream including a group of frames header disposed outside a coded representation of a texture component or a geometry component and identifying a video codec used for coding the texture component or the geometry component; and transmitting the encoded bitstream toward a decoder.

CLAIMS

What is claimed is:

1. A method of point cloud coding (PCC) implemented by a video decoder, comprising:

receiving an encoded bitstream including a group of frames header disposed outside a coded representation of a texture component or a geometry component and identifying a video codec used for coding the texture component or the geometry component; and

decoding the encoded bitstream.

2. A method of point cloud coding (PCC) implemented by a video encoder, comprising:

generating an encoded bitstream including a group of frames header disposed outside a coded representation of a texture component or a geometry component and identifying a video codec used for coding the texture component or the geometry component; and

transmitting the encoded bitstream toward a decoder.

3. The method of any of claims 1 to 2, wherein the coded representation is included in a payload of a PCC network abstraction layer (NAL) unit.

4. The method of any of claims 1 to 3, wherein the payload of the PCC NAL unit contains the geometry component corresponding to the video codec.

5. The method of any of claims 1 to 3, wherein the payload of the PCC NAL unit contains the texture component corresponding to the video codec.

6. The method of any of claims 1 to 5, wherein the video codec is high efficiency video coding (HEVC).

7. The method of any of claims 1 to 5, wherein the video codec is advanced video coding (AVC).

8. The method of any of claims 1 to 5, wherein the video codec is versatile video coding (VVC).

9. The method of any of claims 1 to 5, wherein the video codec is essential video coding (EVC).

10. The method of any of claims 1 to 9, wherein the geometry component comprises a set of coordinates associated with a point cloud frame.

11. The method of claim 10, wherein the set of coordinates are Cartesian coordinates.

12. The method of any of claims 1 to 11, wherein the texture component comprises a set of luma sample values of a point cloud frame.

13. A coding apparatus, comprising:

a receiver configured to receive a picture to encode or to receive a bitstream to decode;

a transmitter coupled to the receiver, the transmitter configured to transmit the bitstream to a decoder or to transmit a decoded image to a display;

a memory coupled to at least one of the receiver or the transmitter, the memory configured to store instructions; and

a processor coupled to the memory, the processor configured to execute the instructions stored in the memory to perform the method in any of claims 1 to 12.

14. The coding apparatus of claim 6, further comprising a display configured to display an image.

15. A system, comprising:

an encoder; and

a decoder in communication with the encoder, wherein the encoder or the decoder includes the coding apparatus of any of claims 13 to 14.

16. A means for coding, comprising:

receiving means configured to receive a picture to encode or to receive a bitstream to decode;

transmission means coupled to the receiving means, the transmission means configured to transmit the bitstream to a decoder or to transmit a decoded image to a display means;

storage means coupled to at least one of the receiving means or the transmission means, the storage means configured to store instructions; and

processing means coupled to the storage means, the processing means configured to execute the instructions stored in the storage means to perform the method in any of claims 1 to 12.

CLAIMS

1. A method of point cloud coding (PCC) implemented by a video decoder, comprising:

receiving an encoded bitstream including a group of frames header disposed outside a coded representation of a texture component and a geometry component, wherein the group of frames, GOF header includes an identified_codec parameter for identifying a video codec used for coding the texture component and the geometry component; and

decoding the encoded bitstream,

wherein if the identified_codec parameter has a first value, it indicates a high efficiency video coding (HEVC) used for coding the texture component and the geometry component, or

if the identified_codec parameter has a second value, it indicates an advanced video coding (AVC) used for coding the texture component and the geometry component.

2. A method of point cloud coding (PCC) implemented by a video encoder, comprising:

generating an encoded bitstream including a group of frames header disposed outside a coded representation of a texture component and a geometry component, wherein the group of frames, GOF header includes an identified_codec parameter for identifying a video codec used for coding the texture component and the geometry component; and

transmitting the encoded bitstream toward a decoder,

wherein if the identified_codec parameter has a first value, it indicates a high efficiency video coding (HEVC) used for coding the texture component and the geometry component, or

if the identified_codec parameter has a second value, it indicates an advanced video coding (AVC) used for coding the texture component and the geometry component.

3. The method of any of claims 1 to 2, wherein the coded representation is included in a payload of a PCC network abstraction layer (NAL) unit.

4. The method of any of claims 1 to 2, wherein the payload of the PCC NAL unit contains the geometry component corresponding to the video codec.

5. The method of any of claims 1 to 2, wherein the payload of the PCC NAL unit contains the texture component corresponding to the video codec.

6. A coding apparatus, comprising:

a receiver configured to receive a picture to encode or to receive a bitstream to decode;

a transmitter coupled to the receiver, the transmitter configured to transmit the bitstream to a decoder or to transmit a decoded image to a display;

a memory coupled to at least one of the receiver or the transmitter, the memory configured to store instructions; and

a processor coupled to the memory, the processor configured to execute the instructions stored in the memory to perform the method in any of claims 1 to 2.

7. The coding apparatus of claim 6, further comprising a display configured to display an image.