WHAT IS CLAIMED IS:

1. A method of transmitting point cloud data, the method comprises:

encoding the point cloud data including geometry and attribute, the geometry represents positions of points of the point cloud data, the attribute includes at least one of colors or reflectance of the points,

wherein the encoding the point cloud data includes:

encoding the geometry; and

encoding the attribute based on a partial octree of the geometry,

wherein the attribute is encoded based on a weight related to an LOD, Level of Detail, of one or more LODs,

wherein the weight is derived based on a part of a number of the points in the one or more LODs and a number of points in the LOD; and

transmitting a bitstream including the encoded point cloud data.

2. The method of claim 1,

wherein the attribute is encoded based on a partial tree of the geometry,

wherein the encoding the attribute includes:

generating one or more LODs by reorganizing the points;

lifting transform coding the attribute based on the one or more LODs; and

quantization processing the transformed attribute based on the weight.

3. The method of claim 2,

wherein the weight is used to decode the encoded attribute based on the partial octree.

4. The method of claim 3,

wherein the bitstream includes signaling information representing whether the encoded attribute is decoded based on the partial octree.

5. The method of claim 1, wherein weight is represented as follows:

$W_{extended\ LoD_l} = \frac{\text{Total point number}}{point\ number\ in\ LoD_l}$, $W_{extended\ LoD_l}$ represents the weight, the total point number represents the number of the points, the point number in LoDl represents a num ber of points in the LODl.

6. A device of transmitting point cloud data, the device comprises:

an encoder configured to encode the point cloud data including geometry and attribute, wherein the geometry represents positions of points of the point cloud data, the attribute includes at least one of colors or reflectance of the points,

wherein the encoder includes:

a geometry encoder configured to encode the geometry; and

an attribute encoder configured to encode the attribute based on a partial octree of the geometry,

wherein the attribute is encoded based on a weight related to an LOD, Level of Detail, of one or more LODs,

wherein the weight is derived based on a part of a number of the points in the one or more LODs and a number of points in the LOD; and

a transmitter configured to transmit a bitstream including the encoded point cloud data.

7. The device of claim 6,

wherein the attribute is encoded based on a partial tree of the geometry,

wherein the attribute encoder configured to:

generate one or more LODs by reorganizing the points,
perform lifting transform coding the attribute based on the one or more LODs,

perform quantization processing the transformed attribute.

8. The device of claim 6,

wherein the weight is represented as follows:

$$W_{extended\ LoD_l} = \frac{\text{Total point number}}{point\ number\ in\ LoD_l}$$

$W_{extended\ LoD_l}$ represents the weight, the total point number represents the number of the points, the point number in LoDl represents a number of points in the LODl.

9. A method of processing point cloud data, the method comprising:
receiving a bitstream including the point cloud data, the bitstream including signaling information; and

decoding the point cloud data based on the signaling information,

wherein the decoding the point cloud data includes:

decoding geometry included in the point cloud data, wherein the geometry represents positions of points of the point cloud data; and

decoding attribute, that includes at least one of colors or reflectance of the points, based on a partial octree of the geometry,

wherein the attribute is decoded based on a weight related to an LOD, Level of Detail, of one or more LODs, and

wherein the weight is derived based on a part of a number of the points in the one or more LODs and a number of points in the LOD.

10. The method of claim 9,

wherein the signaling information includes scalability information representing whether lifting transform decoding attribute based on the partial octree is allowed.

11. The method of claim 10, wherein the attribute is decoded based on a partial tree of the geometry, wherein the decoding the attribute includes:

generating one or more LODs by reorganizing the points;

lifting transform decoding the attribute based on the one or more LODs; and

inverse quantization processing the decoded attribute.

12. The method of claim 11, wherein the weight is computed for each point in each LOD from 0^{th} LOD to the last LOD.

13. A device of processing point cloud data, the device comprising:
a receiver to receive a bitstream including the point cloud data, wherein the bitstream includes signaling information; and
a decoder to decode the point cloud data based on the signaling information,
wherein the decoder includes:
a geometry decoder to decode geometry included in the point cloud data, the geometry represents positions of points of the point cloud data; and
an attribute decoder to decoded attribute including at least one of colors or reflectance of the points based on a partial octree of the geometry,
wherein the attribute is decoded based on a weight related to an LOD, Level of Detail, of one or more LODs,
wherein the weight is derived based on a part of a number of the points in the one or more LODs and a number of points in the LOD.

14. The device of claim 13,

wherein the signaling information includes scalability information representing whether lifting transform decoding attribute based on the partial octree is allowed, the weight is computed for each point in each LOD from 0^{th} LOD to the last LOD.

15. The device of claim 14, wherein the attribute is decoded based on a partial tree of the geometry, wherein the attribute decoder is configured to:

generate one or more LODs by reorganizing the points;

lifting transform decode the attribute based on the one or more LODs; and

inverse quantization process the decoded attribute.