CLAIMS

1. A method of encoding point cloud data, the method comprising:

storing, in a buffer, a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently encoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis;

determining, from among a plurality of contexts, a context for a planar mode plane position of the current node,

wherein determining the context for the planar mode plane position comprises determining a context index that indicates the context, wherein determining the context index comprises:

determining a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node stored in the buffer and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

determining an increment value that indicates whether the value is greater than a threshold; and

determining the context index based on the increment value; and

entropy encoding the planar mode plane position using the determined context.

2. The method of claim 1, further comprising encoding at least one point of the point cloud data based on the planar mode plane position.

3. The method of claim 1, wherein storing the maximum coordinate of the pair of coordinates of the applicable node comprises:

retaining the fourth through eighth most significant bits of the maximum coordinate of the pair of coordinates of the applicable node and discarding the three least significant bits of the maximum coordinate of the pair of coordinates of the applicable node.

4. The method of claim 1, wherein determining the increment value comprises determining the increment value as being equal to either 1 or 0 based on whether the value is greater than or less than 1.

5. The method of claim 1, further comprising generating the point cloud data.

6. A method of decoding point cloud data, the method comprising:

storing, in a buffer, a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently decoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis;

determining, from among a plurality of contexts, a context for a planar mode plane position of the current node,

wherein determining the context for the planar mode plane position comprises determining a context index that indicates the context, wherein determining the context index comprises:

determining a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node stored in the buffer and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

determining an increment value that indicates whether the value is greater than a threshold; and

determining the context index based on the increment value; and

entropy decoding the planar mode plane position using the determined context.

7. The method of claim 6, further comprising decoding at least one point of the point cloud data based on the planar mode plane position.

8. The method of claim 6, wherein storing the maximum coordinate of the pair of coordinates of the applicable node comprises:

retaining the fourth through eighth most significant bits of the maximum coordinate of the pair of coordinates of the applicable node and discarding the three least significant bits of the maximum coordinate of the pair of coordinates of the applicable node.

9. The method of claim 6, wherein determining the increment value comprises determining the increment value as being equal to either 1 or 0 based on whether the value is greater than or less than 1.

10. A device for encoding point cloud data, the device comprising:

a buffer configured to store a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently encoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis; and

one or more processors implemented in circuitry, the one or more processors configured to:

determine, from among a plurality of contexts, a context for a planar mode plane position of the current node, wherein the one or more processors are configured to, as part of determining the context for the planar mode plane position, determine a context index that indicates the context, and the one or more processors are configured to, as part of determining the context index:

determine a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node stored in the buffer and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

determine an increment value that indicates whether the value is greater than a threshold; and

determine the context index based on the increment value; and

entropy encode the planar mode plane position using the determined context.

11. The device of claim 10, wherein the one or more processors are further configured to encode at least one point of the point cloud data based on the planar mode plane position.

12. The device of claim 10, wherein the one or more processors are configured to, as part of storing the maximum coordinate of the pair of coordinates of the applicable node in the buffer, retain the fourth through eighth most significant bits of the maximum coordinate of the pair of coordinates of the applicable node and discard the three least significant bits of the maximum coordinate of the pair of coordinates of the applicable node.

13. The device of claim 10, wherein the one or more processors are configured to, as part of determining the increment value, determine the increment value as being equal to either 1 or 0 based on whether the value is greater than or less than 1.

14. The device of claim 10, further comprising a display to present imagery based on the point cloud data.

15. The device of claim 10, wherein the device is configured to generate the point cloud data.

16. The device of claim 15, wherein the one or more processors are configured to, as part of generating the point cloud data, generate the point cloud data based on signals from a LIDAR apparatus.

17. The device of claim 10, wherein the device is one of a mobile phone or tablet computer.

18. The device of claim 10, wherein the device is a vehicle.

19. The device of claim 10, wherein the device is an extended reality device.

20. The device of claim 10, wherein the device comprises an interface configured to transmit the point cloud data.

21. A device for decoding point cloud data, the device comprising:

a buffer configured to store a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently decoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis; and

one or more processors implemented in circuitry, the one or more processors configured to:

determine, from among a plurality of contexts, a context for a planar mode plane position of the current node, wherein the one or more processors are configured to, as part of determining the context for the planar mode plane position, determine a context index that indicates the context, and the one or more processors are configured to, as part of determining the context index:

determine a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node stored in the buffer and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

determine an increment value that indicates whether the value is greater than a threshold; and

determine the context index based on the increment value; and

entropy decode the planar mode plane position using the determined context.

22. The device of claim 21, wherein the one or more processors are further configured to decode at least one point of the point cloud data based on the planar mode plane position.

23. The device of claim 21, wherein the one or more processors are configured to, as part of storing the maximum coordinate of the pair of coordinates of the applicable node to the buffer, retain the fourth through eighth most significant bits of the maximum coordinate of the pair of coordinates of the applicable node and discard the three least significant bits of the maximum coordinate of the pair of coordinates of the applicable node.

24. The device of claim 21, wherein the one or more processors are configured to, as part of determining the increment value, determine the increment value as being equal to either 1 or 0 based on whether the value is greater than or less than 1.

25. The device of claim 21,

wherein the one or more processors are further configured to reconstruct the point cloud data, and

wherein the one or more processors are configured to, as part of reconstructing the point cloud data, determine positions of one or more points of the point cloud data based on the planar mode plane position.

26. The device of claim 25, wherein the one or more processors are further configured to generate a map of an interior of a building based on the reconstructed point cloud data.

27. The device of claim 25, wherein the one or more processors are further configured to perform an autonomous navigation operation based on the reconstructed point cloud data.

28. The device of claim 25, wherein the one or more processors are further configured to generate computer graphics based on the reconstructed point cloud data.

29. The device of claim 28, wherein the one or more processors are configured to:

determine a position of a virtual object based on the reconstructed point cloud data; and

generate an extended reality (XR) visualization in which the virtual object is at the determined position.

30. The device of claim 21, wherein the device is one of a mobile phone or tablet computer.

31. The device of claim 21, wherein the device is a vehicle.

32. The device of claim 21, wherein the device is an extended reality device.

33. The device of claim 21, further comprising a display to present imagery based on the point cloud data.

34. A device for encoding point cloud data, the device comprising:

means for storing a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently encoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis;

means for determining, from among a plurality of contexts, a context for a planar mode plane position of the current node, wherein the means for determining the context for the planar mode plane position of the current node comprises means for determining a context index that indicates the context, and the means for determining the context index comprises:

means for determining a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

means for determining an increment value that indicates whether the value is greater than a threshold; and

means for determining the context index based on the increment value; and

means for entropy encoding the planar mode plane position using the determined context.

35. A device for decoding point cloud data, the device comprising:

means for storing a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently decoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis;

means for determining, from among a plurality of contexts, a context for a planar mode plane position of the current node, wherein the means for determining the context for the planar mode plane position of the current node comprises means for determining a context index that indicates the context, and the means for determining the context index comprises:

means for determining a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

means for determining an increment value that indicates whether the value is greater than a threshold; and

means for determining the context index based on the increment value; and

means for entropy decoding the planar mode plane position using the determined context.

36. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause one or more processors to:

store, in a buffer, a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently encoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis;

determine, from among a plurality of contexts, a context for a planar mode plane position of the current node,

wherein the instructions that cause the one or more processors to determine the context for the planar mode plane position comprise instructions that, when executed, cause the one or more processors to determine a context index that indicates the context, wherein the instructions that cause the one or more processors to determine the context index comprise instructions that, when executed, cause the one or more processors to:

determine a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node stored in the buffer and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

determine an increment value that indicates whether the value is greater than a threshold; and

determine the context index based on the increment value; and

entropy encode the planar mode plane position using the determined context.

37. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause one or more processors to:

store, in a buffer, a maximum coordinate of a pair of coordinates of an applicable node and not a lesser coordinate of the pair of coordinates of the applicable node, wherein the applicable node is a most-recently decoded node with a same position as a current node along an applicable axis and the pair of coordinates are for axes different from the applicable axis;

determine, from among a plurality of contexts, a context for a planar mode plane position of the current node,

wherein the instructions that cause the one or more processors to determine the context for the planar mode plane position comprise instructions that, when executed, cause the one or more processors to determine a context index that indicates the context, wherein the instructions that cause the one or more processors to determine the context index comprise instructions that, when executed, cause the one or more processors to:

determine a value based on a difference between a first value and a second value, the first value being the maximum coordinate of the pair of coordinates of the applicable node stored in the buffer and the second value being whichever coordinate of a pair of coordinates of the current node along the axes different from the applicable axis is greater;

determine an increment value that indicates whether the value is greater than a threshold; and

determine the context index based on the increment value; and

entropy decode the planar mode plane position using the determined context.