CLAIMS

1. A method of processing a point cloud, the method comprising:

selecting, from a set of prediction modes, a prediction mode for a current point, wherein the set of prediction modes includes at least an intra prediction mode and an inter prediction mode, and selecting the prediction mode comprises:

coding, via a bitstream, a first syntax element indicating that the current point is coded using inter prediction; and

selecting the inter prediction mode as the prediction mode for the current point; and

predicting the current point of the point cloud using the inter prediction mode.

2. The method of claim 1, further comprising:

coding, via the bitstream, a second syntax element indicating whether inter prediction is enabled,

wherein coding the first syntax element comprises coding the first syntax element responsive to the second syntax element indicating that inter prediction is enabled.

3. The method of claim 2, wherein the second syntax element indicates whether inter prediction is enabled for a particular frame that includes the current point.

4. The method of claim 1, wherein the current point is in a current frame, and wherein predicting the current point using inter prediction comprises:

determining, in a reference frame that is different than the current frame, a reference point; and

predicting one or more parameters of the current point based on the reference point.

5. The method of claim 4, wherein the reference frame is a motion compensated reference frame.

6. The method of claim 4, wherein predicting the one or more parameters comprises:

predicting one or more of an azimuth, a laser identifier, and a radius of the current point.

7. The method of claim 4, wherein determining the reference point comprises:

determining, in the current frame, a pivot point that precedes the current point in a coding order; and

determining, based on one or more parameters of the pivot point, the reference point.

8. The method of claim 7, wherein determining the reference point based on the one or more parameters of the pivot point comprises:

determining, in the reference frame, a reference pivot point based on an azimuth of the pivot point; and

determining the reference point based on the reference pivot point.

9. The method of claim 8, wherein determining the reference pivot point further comprises determining the reference pivot point based on a laser identifier of the pivot point.

10. The method of claim 8, wherein the reference pivot point is a virtual point in the reference frame.

11. The method of claim 8, wherein determining the reference pivot point based on the azimuth of the pivot point comprises:

determining the reference pivot point based on a scaled azimuth of the pivot point.

12. The method of claim 11, further comprising:

coding a syntax element that specifies a log base 2 value of a scaling factor; and

determining the scaled azimuth of the pivot point based on the scaling factor.

13. The method of claim 8, wherein determining the reference point based on the reference pivot point comprises:

identifying, as the reference point in the reference frame, a point having an azimuth that is greater than an azimuth of the reference pivot point.

14. The method of claim 13, wherein identifying the point in the reference frame having the azimuth that is greater than the azimuth of the reference pivot point comprises:

identifying, as the reference point in the reference frame, a point having a scaled azimuth that is greater than a scaled azimuth of the reference pivot point.

15. The method of claim 14, wherein identifying the point having the scaled azimuth that is greater than the scaled azimuth of the reference pivot point comprises:

identifying, as the point, a point having a smallest scaled azimuth that is larger than the scaled azimuth of the reference pivot point.

16. The method of claim 14, wherein identifying the point having the scaled azimuth that is greater than the scaled azimuth of the reference pivot point comprises:

identifying, as the point, a point having a second smallest scaled azimuth that is larger than the scaled azimuth of the reference pivot point.

17. The method of claim 8, wherein determining the reference point comprises:

determining, in the reference frame and based on the reference pivot point, a plurality of reference points,

wherein predicting the one or more parameters of the current point based on the reference point comprises predicting the one or more parameters of the current point based on the plurality of reference points.

18. The method of claim 4, wherein the identified reference point comprises a zero-motion candidate.

19. The method of claim 1, further comprising:

coding, via a bitstream, a third syntax element indicating the inter prediction mode for the current point.

20. The method of claim 1, further comprising selecting a context for context adaptive binary arithmetic coding (CABAC) one or more syntax elements based on a value of the first syntax element.

21. The method of claim 20, wherein the one or more syntax elements comprise one or more of:

one or more syntax elements that represent a phi multiplier; and

one or more syntax elements that represent primary residual data.

22. The method of claim 20, further comprising:

selecting a context for CABAC coding the first syntax element based on values of inter prediction syntax elements for N previous points of the point cloud.

23. The method of claim 22, wherein N is 5.

24. A device for processing a point cloud, the device comprising:

a memory configured to store at least a portion of the point cloud; and

one or more processors implemented in circuitry and configured to:

select, from a set of prediction modes, a prediction mode for a current point, wherein the set of prediction modes includes at least an intra prediction mode and an inter prediction mode, and to select the prediction mode, the one or more processors are further configured to:

code, via a bitstream, a first syntax element indicating that the current point is coded using inter prediction; and

select the inter prediction mode as the prediction mode for the current point; and

predict, the current point of the point cloud using the inter prediction mode.

25. The device of claim 24, wherein the one or more processors are further configured to:

code, via the bitstream, a second syntax element indicating whether inter prediction is enabled,

wherein, to code the first syntax element, the one or more processors are configured to code the first syntax element responsive to the second syntax element indicating that inter prediction is enabled.

26. The device of claim 25, wherein the second syntax element indicates whether inter prediction is enabled for a particular frame that includes the current point.

27. The device of claim 24, wherein the current point is in a current frame, and wherein, to predict the current point using inter prediction, the one or more processors are configured to:

determine, in a reference frame that is different than the current frame, a reference point; and

predict one or more parameters of the current point based on the reference point.

28. The device of claim 27, wherein the reference frame is a motion compensated reference frame.

29. The device of claim 27, wherein, to predict the one or more parameters, the one or more processors are configured to:

predict one or more of an azimuth, a laser identifier, and a radius of the current point.

30. The device of claim 27, wherein, to determine the reference point, the one or more processors are configured to:

determine, in the current frame, a pivot point that precedes the current point in a coding order; and

determine, based on one or more parameters of the pivot point, the reference point.

31. The device of claim 30, wherein, to determine the reference point based on the one or more parameters of the pivot point, the one or more processors are configured to:

determine, in the reference frame, a reference pivot point based on an azimuth of the pivot point; and

determine the reference point based on the reference pivot point.

32. The device of claim 31, wherein, to determine the reference pivot point, the one or more processors are configured to determine the reference pivot point based on a laser identifier of the pivot point.

33. The device of claim 31, wherein the reference pivot point is a virtual point in the reference frame.

34. The device of claim 31, wherein, to determine the reference pivot point based on the azimuth of the pivot point, the one or more processors are configured to:

determine the reference pivot point based on a scaled azimuth of the pivot point.

35. The device of claim 34, wherein the one or more processors are further configured to:

code a syntax element that specifies a log base 2 value of a scaling factor; and

determine the scaled azimuth of the pivot point based on the scaling factor.

36. The device of claim 31, wherein, to determine the reference point based on the reference pivot point, the one or more processors are configured to:

identify, as the reference point in the reference frame, a point having an azimuth that is greater than an azimuth of the reference pivot point.

37. The device of claim 36, wherein, to identify the point in the reference frame having the azimuth that is greater than the azimuth of the reference pivot point, the one or more processors are configured to:

identify, as the reference point in the reference frame, a point having an azimuth that is greater than a scaled azimuth of the reference pivot point.

38. The device of claim 37, wherein, to identify the point having the scaled azimuth that is greater than the scaled azimuth of the reference pivot point, the one or more processors are configured to:

identify, as the point, a point having a smallest scaled azimuth that is larger than the scaled azimuth of the reference pivot point.

39. The device of claim 37, wherein, to identify the point having the scaled azimuth that is greater than the scaled azimuth of the reference pivot point, the one or more processors are configured to:

identify, as the point, a point having a second smallest scaled azimuth that is larger than the scaled azimuth of the reference pivot point.

40. The device of claim 31, wherein, to determine the reference point, the one or more processors are configured to:

determine, in the reference frame and based on the reference pivot point, a plurality of reference points,

wherein, to predict the one or more parameters of the current point based on the reference point, the one or more processors are configured to predict the one or more parameters of the current point based on the plurality of reference points.

41. The device of claim 27, wherein the identified reference point comprises a zero-motion candidate.

42. The device of claim 24, wherein the one or more processors are further configured to: code, via a bitstream, a third syntax element indicating the inter prediction mode for the current point.

43. The device of claim 24, wherein the one or more processors are further configured to:

select a context for context adaptive binary arithmetic coding (CABAC) one or more syntax elements based on a value of the first syntax element.

44. The device of claim 43, wherein the one or more syntax elements comprise one or more of:

one or more syntax elements that represent a phi multiplier; and

one or more syntax elements that represent primary residual data.

45. The device of claim 43, the one or more processors are further configured to:

select a context for CABAC coding the first syntax element based on values of inter prediction syntax elements for N previous points of the point cloud.

46. The device of claim 45, wherein N is 5.

47. The device of claim 24, further comprising:

a spinning LIDAR sensor, wherein the one or more processors are configured to generate the point cloud based on data generated by the spinning LIDAR sensor.

48. The device of claim 47, wherein the device is a vehicle that includes the spinning LIDAR sensor.

49. The device of claim 24, wherein the device is a wireless communication device.

50. A non-transitory computer-readable storage medium storing instructions that, when executed by one or more processors, cause the one or more processors to:

select, from a set of prediction modes, a prediction mode for a current point, wherein the set of prediction modes includes at least an intra prediction mode and an inter prediction mode and to select the prediction mode, the instructions further cause the one or more processors to:

code, via a bitstream, a first syntax element indicating that the current point is coded using inter prediction; and

select the inter prediction mode as the prediction mode for the current point; and predict the current point of the point cloud using the inter prediction mode.