

CLAIMS

1. A method of decoding video data, the method comprising:
 - receiving a first encoded block of video data that was encoded using an inter-prediction mode with a translational motion model;
 - receiving one or more first syntax elements indicating a first motion vector difference (MVD) associated with the first encoded block of video data where a first plurality of MVD precisions are available for the first encoded block;
 - receiving a first MVD precision syntax element indicative of a first current MVD precision among the first plurality of MVD precisions available for the first encoded block;
 - determining the first current MVD precision based on the first MVD precision syntax element;
 - modifying the first MVD using the determined first current MVD precision;
 - decoding the first encoded block of video data using the first MVD;
 - receiving a second encoded block of video data that was encoded using inter-prediction with an affine motion model;
 - receiving one or more second syntax elements indicating a second MVD associated with the second encoded block of video data where a second plurality of MVD precisions are available for the second encoded block;
 - receiving, separate from the first MVD precision syntax element, a second MVD precision syntax element indicative of a second current MVD precision among the second plurality of MVD precisions available for the second encoded block;
 - determining a second current MVD precision based on the second MVD precision syntax element;
 - modifying the second MVD using the determined second current MVD precision; and
 - decoding the second encoded block of video data using the second MVD.
2. The method of claim 1, wherein the first plurality of MVD precisions includes an N-sample MVD precision, where N is an integer indicating a number of samples indicated by each successive codeword of the one or more first syntax elements indicating the MVD, wherein N is greater than 1, and wherein the inter-prediction mode is an advanced motion vector prediction

mode.

3. The method of claim 2, wherein N is one of 2, 3, or 4 luma samples.
4. The method of claim 2, wherein the first plurality of MVD precisions includes a one-quarter luma sample MVD precision, an integer luma sample MVD precision, and one or more N-sample MVD precisions.
5. The method of claim 1, further comprising:
decoding the first MVD precision syntax element indicative of the first current MVD precision.
6. The method of claim 5, further comprising receiving the first MVD precision syntax element when the following is true: the first encoded block of video data is not intra-coded, the first encoded block of video data is not coded with merge or skip mode, and the first encoded block of video data is coded with advanced motion vector prediction (AMVP) mode and the first MVD is not zero.
7. The method of claim 6, further comprising:
deriving a default motion vector precision for use as the first current MVD precision in the case that the first MVD precision syntax element is not received.
8. The method of claim 6, further comprising:
deriving, based on the inter-prediction mode, the first current MVD precision in the case that the first MVD precision syntax element is not received
9. The method of claim 8, wherein deriving the first current MVD precision comprises deriving a one-quarter luma sample MVD precision in the case that the inter-prediction mode is AMVP mode, and deriving a one-eighth luma sample or one-sixteenth luma sample MVD precision in the case that the inter-prediction mode is a merge mode or a skip mode.

10. The method of claim 5, wherein the first MVD precision syntax element indicates the value of N for an N-sample MVD precision.
11. The method of claim 5, further comprising:
 - determining a context for arithmetic decoding of the first MVD precision syntax element based on one or more of a block size, a value of the first MVD, a reference picture index, MVD precision information of spatial neighboring blocks, or a Picture Order Count (POC) difference of a current picture and a reference picture; and
 - decoding the first MVD precision syntax element using arithmetic coding and the determined context.
12. The method of claim 1, further comprising:
 - receiving the first MVD precision syntax element indicating the first current MVD precision in one or more of a sequence parameter set, a picture parameter set, or a slice header; and
 - decoding the first MVD precision syntax element indicating the first current MVD precision.
13. The method of claim 1, further comprising:
 - determining a motion vector for the first encoded block of video data using a motion vector precision that is the same as the first current MVD precision.
14. The method of claim 1, further comprising:
 - determining a motion vector for the first encoded block of video data using a motion vector precision that is different than the first current MVD precision.
15. The method of claim 1, further comprising:
 - determining motion vector predictor candidates for the first encoded block of video data; and
 - rounding the motion vector predictor candidates for the first encoded block of video data using the first current MVD precision based on whether the first MVD is zero.

16. The method of claim 1, further comprising:
 - determining motion vector predictor candidates for the first encoded block of video data;
 - and
 - rounding the motion vector predictor candidates for the first encoded block of video data using the first current MVD precision based on whether a particular motion vector predictor candidate is a temporal candidate or a spatial candidate.

17. An apparatus configured to decode video data, the apparatus comprising:
 - a memory configured to store a first encoded block of video data; and
 - one or more processors in communication with the memory, the one or more processors configured to:
 - receive the first encoded block of video data that was encoded using an inter-prediction mode with a translational motion model;
 - receive one or more first syntax elements indicating a first motion vector difference (MVD) associated with the first encoded block of video data where a first plurality of MVD precisions are available for the first encoded block;
 - receive a first MVD precision syntax element indicative of a first current MVD precision among the first plurality of MVD precisions available for the first encoded block;
 - determine the first current MVD precision based on the first MVD precision syntax element;
 - modify the first MVD using the determined first current MVD precision;
 - decode the first encoded block of video data using the first MVD;
 - receive a second encoded block of video data that was encoded using inter-prediction with an affine motion model;
 - receive one or more second syntax elements indicating a second MVD associated with the second encoded block of video data where a second plurality of MVD precisions are available for the second encoded block;
 - receive, separate from the first MVD precision syntax element, a second MVD precision syntax element indicative of a second current MVD precision among the second plurality of MVD precisions available for the second encoded block;

determine a second current MVD precision based on the second MVD precision syntax element;
 modify the second MVD using the determined second current MVD precision;
 and
 decode the second encoded block of video data using the second MVD.

18. The apparatus of claim 17, wherein the first plurality of MVD precisions includes an N-sample MVD precision, where N is an integer indicating a number of samples indicated by each successive codeword of the one or more first syntax elements indicating the MVD, wherein N is greater than 1, and wherein the inter-prediction mode is an advanced motion vector prediction mode.
19. The apparatus of claim 18, wherein N is one of 2, 3, or 4 luma samples.
20. The apparatus of claim 18, wherein the first plurality of MVD precisions includes a one-quarter luma sample MVD precision, an integer luma sample MVD precision, and one or more N-sample MVD precisions.
21. The apparatus of claim 17, wherein the one or more processors are further configured to:
 decode the first MVD precision syntax element indicative of the first current MVD precision.
22. The apparatus of claim 21, wherein the one or more processors are further configured to receive the first MVD precision syntax element when the following is true: the first encoded block of video data is not intra-coded, the first encoded block of video data is not coded with merge or skip mode, and the first encoded block of video data is coded with advanced motion vector prediction (AMVP) mode and the first MVD is not zero.
23. The apparatus of claim 22, wherein the one or more processors are further configured to:
 derive a default motion vector precision for use as the first current MVD precision in the case that the first MVD precision syntax element is not received.

24. The apparatus of claim 22, wherein the one or more processors are further configured to:
derive, based on the inter-prediction mode, the first current MVD precision in the case that the first MVD precision syntax element is not received.
25. The apparatus of claim 24, wherein to derive the first current MVD precision, the one or more processors are further configured to derive a one-quarter luma sample MVD precision in the case that the inter-prediction mode is AMVP mode, and derive a one-eighth luma sample or one-sixteenth luma sample MVD precision in the case that the inter-prediction mode is a merge mode or a skip mode.
26. The apparatus of claim 21, wherein the first MVD precision syntax element indicates the value of N for an N-sample MVD precision.
27. The apparatus of claim 21, wherein the one or more processors are further configured to:
determine a context for arithmetic decoding of the first MVD precision syntax element based on one or more of a block size, a value of the first MVD, a reference picture index, MVD precision information of spatial neighboring blocks, or a Picture Order Count (POC) difference of a current picture and a reference picture; and
decode the first MVD precision syntax element using arithmetic coding and the determined context.
28. The apparatus of claim 17, wherein the one or more processors are further configured to:
receive the first MVD precision syntax element indicating the first current MVD precision in one or more of a sequence parameter set, a picture parameter set, or a slice header; and
decode the first MVD precision syntax element indicating the first current MVD precision.
29. The apparatus of claim 17, wherein the one or more processors are further configured to:
determine a motion vector for the first encoded block of video data using a motion vector

precision that is the same as the first current MVD precision.

30. The apparatus of claim 17, wherein the one or more processors are further configured to:
determine a motion vector for the first encoded block of video data using a motion vector
precision that is different than the first current MVD precision.

31. The apparatus of claim 17, wherein the one or more processors are further configured to:
determine motion vector predictor candidates for the first encoded block of video data;
and
round the motion vector predictor candidates for the first encoded block of video data
using the first current MVD precision based on whether the first MVD is zero.

32. The apparatus of claim 17, wherein the one or more processors are further configured to:
determine motion vector predictor candidates for the first encoded block of video data;
and
round the motion vector predictor candidates for the first encoded block of video data
using the first current MVD precision based on whether a particular motion vector predictor
candidate is a temporal candidate or a spatial candidate.

33. The apparatus of claim 17, wherein the apparatus comprises a wireless communication
device, further comprising a receiver configured to receive the first encoded block of video data.

34. The apparatus of claim 17, wherein the wireless communication device comprises a
telephone handset and wherein the receiver is configured to demodulate, according to a wireless
communication standard, a signal comprising the first encoded block of video data.

35. The apparatus of claim 17, further comprising:
a display configured to output a picture comprising the decoded first block of video data
and decoded second block of video data.

36. An apparatus configured to decode video data, the apparatus comprising:

means for receiving a first encoded block of video data that was encoded using an inter-prediction mode with a translational motion model;

means for receiving one or more first syntax elements indicating a first motion vector difference (MVD) associated with the first encoded block of video data where a first plurality of MVD precisions are available for the first encoded block coded using the translation motion model;

means for receiving a first MVD precision syntax element indicative of a first current MVD precision among the first plurality of MVD precisions available for the first encoded block;

means for determining the first current MVD precision based on the first MVD precision syntax element;

means for modifying the first MVD using the determined first current MVD precision;

means for decoding the first encoded block of video data using the first MVD;

means for receiving a second encoded block of video data that was encoded using inter-prediction with an affine motion model;

means for receiving one or more second syntax elements indicating a second MVD associated with the second encoded block of video data where a second plurality of MVD precisions are available for the second encoded block being coded using the affine motion model;

means for receiving, separate from the first MVD precision syntax element, a second MVD precision syntax element indicative of a second current MVD precision among the second plurality of MVD precisions available for the second encoded block;

means for determining a second current MVD precision based on the second MVD precision syntax element;

means for modifying the second MVD using the determined second current MVD precision; and

means for decoding the second encoded block of video data using the second MVD.

37. A non-transitory computer-readable storage medium storing instructions that, when executed, cause one or more processors of a device configured to decode video data to:

receive a first encoded block of video data that was encoded using an inter-prediction

mode with a translational motion model;

receive one or more first syntax elements indicating a first motion vector difference (MVD) associated with the first encoded block of video data where a first plurality of MVD precisions are available for the first encoded block coded using the translation motion model;

receive a first MVD precision syntax element indicative of a first current MVD precision among the first plurality of MVD precisions available for the first encoded block;

determine the first current MVD precision based on the first MVD precision syntax element;

modifying the first MVD using the determined first current MVD precision;

decode the first encoded block of video data using the first MVD;

receive a second encoded block of video data that was encoded using inter-prediction with an affine motion model;

receive one or more second syntax elements indicating a second MVD associated with the second encoded block of video data where a second plurality of MVD precisions are available for the second encoded block being coded using the affine motion model;

receive, separate from the first MVD precision syntax element, a second MVD precision syntax element indicative of a second current MVD precision among the second plurality of MVD precisions available for the second encoded block;

determine a second current MVD precision based on the second MVD precision syntax element;

modify the second MVD using the determined second current MVD precision; and

decode the second encoded block of video data using the second MVD.

38. A method of encoding video data, the method comprising:

receiving a first block of video data to be encoded using an inter-prediction mode with a translational motion model;

determining a first motion vector difference (MVD) for the first block of video data where a first plurality of MVD precisions are available for the first encoded block coded using the translation motion model;

determining a first current MVD precision among the first plurality of MVD precisions available for the first encoded block;

encoding the first block of video data using the first MVD and the translational motion model;

encoding a first MVD precision syntax element indicative of the first current MVD precision among the first plurality of MVD precisions available for the first encoded block;

receiving a second block of video data to be encoded using inter-prediction with an affine motion model;

determining a second MVD for the second block of video data where a second plurality of MVD precisions are available for the second encoded block coded using the affine motion model;

determining a second current MVD precision among the second plurality of MVD precisions available for the second encoded block;

encoding the second block of video data using the second MVD and the affine motion model; and

encoding a second MVD precision syntax element indicative of the second current MVD precision among the second plurality of MVD precisions available for the second encoded block.

39. The method of claim 38, wherein the first set of MVD precision information includes an N-sample MVD precision, where N is an integer indicating a number of samples indicated by each successive codeword of the one or more first syntax elements indicating the first MVD, wherein N is greater than 1, wherein the inter-prediction mode is an advanced motion vector prediction mode, and wherein the motion model is the translational motion model.

40. The method of claim 39, wherein N is one of 2, 3, or 4 luma samples.

41. The method of claim 39, wherein the first plurality of MVD precisions includes a one-quarter luma sample MVD precision, an integer luma sample MVD precision, and one or more N-sample MVD precisions.

42. The method of claim 38, further comprising:

encoding the first MVD precision syntax element indicating the first current MVD precision for one or more of a coding unit or a prediction unit of the first block of video data.

43. The method of claim 42, wherein the first MVD precision syntax element indicates the value of N for an N-sample MVD precision.
44. The method of claim 42, further comprising:
determining a context for arithmetic encoding of the first MVD precision syntax element based on one or more of a block size, a value of the first MVD, a reference picture index, MVD precision information of spatial neighboring blocks, or a Picture Order Count (POC) difference of a current picture and a reference picture; and
encoding the first MVD precision syntax element using arithmetic coding and the determined context.
45. The method of claim 38, further comprising:
determining a motion vector for the first block of video data using a motion vector precision that is the same as the first current MVD precision.
46. The method of claim 38, further comprising:
determining a motion vector for the first block of video data using a motion vector precision that is different than the first current MVD precision.
47. The method of claim 38, further comprising:
determining motion vector predictor candidates for the first block of video data; and
rounding the motion vector predictor candidates for the first block of video data using the first current MVD precision based on whether the first MVD is zero.
48. The method of claim 38, further comprising:
determining motion vector predictor candidates for the first block of video data; and
rounding the motion vector predictor candidates for the first block of video data using the first current MVD precision based on whether a particular motion vector predictor candidate is a temporal candidate or a spatial candidate.

49. An apparatus configured to encode video data, the apparatus comprising:
 a memory configured to store a first block of video data; and
 one or more processors in communication with the memory, the one or more processors configured to:
- receive the first block of video data to be encoded using an inter-prediction mode with a translational motion model;
 - determine a first motion vector difference (MVD) for the first block of video data where a first plurality of MVD precisions are available for the first encoded block coded using the translation motion model;
 - determine a first current MVD precision among the first plurality of MVD precisions available for the first encoded block;
 - encode the first block of video data using the first MVD and the translational motion model;
 - encode a first MVD precision syntax element indicative of the first current MVD precision among the first plurality of MVD precisions available for the first encoded block;
 - receive a second block of video data to be encoded using inter-prediction with an affine motion model;
 - determine a second MVD for the second block of video data where a second plurality of MVD precisions are available for the second encoded block coded using the affine motion model;
 - determine a second current MVD precision among the second plurality of MVD precisions available for the second encoded block;
 - encode the second block of video data using the second MVD and the affine motion model; and
 - encode a second MVD precision syntax element indicative of the second current MVD precision among the second plurality of MVD precisions available for the second encoded block.
50. The apparatus of claim 49, further comprising:
 a camera configured to capture a picture including the first block of video data.