CLAIMS

1. A method of decoding video data, the method comprising:

determining that motion information of a current block of video data is to be derived using decoder-side motion vector derivation (DMVD);

determining a pixels clue for the current block, the pixels clue comprising pixel data obtained from one or more groups of previously decoded pixels;

determining an inter-prediction direction for the motion information according to matching costs between different prediction directions, wherein determining the inter-prediction direction comprises scaling weighting costs associated with uni-prediction up by a scaling factor;

deriving the motion information for the current block according to DMVD from the pixels clue, wherein deriving the motion information comprises deriving the motion information according to DMVD such that the motion information has the determined inter-prediction direction; and

decoding the current block using the motion information.

2. The method of claim 1, wherein determining the pixels clue comprises generating the pixels clue using multiple hypothesis predictions from multiple motion compensated blocks.

3. The method of claim 2, wherein generating the pixels clue comprises calculating a weighted average of the multiple motion compensated blocks.

4. The method of claim 2, wherein generating the pixels clue comprises applying overlapped block motion compensation to generate the pixels clue.

5. The method of claim 2, further comprising:

adding offsets to motion vectors of the current block; and

deriving the multiple motion compensated blocks from the offset motion vectors.

6. The method of claim 1, wherein determining the inter-prediction direction comprises selecting the inter-prediction direction having the smallest matching cost.

7. The method of claim 1, wherein determining the inter-prediction direction comprises selecting one of prediction from list0, prediction from list1, or bi-prediction.

8. The method of claim 1, wherein the scaling value comprises 1.25.

9. The method of claim 1, wherein determining the inter-prediction direction comprises scaling a weighting cost associated with bi-prediction down by a scaling value.

10. The method of claim 9, wherein the scaling value comprises 0.75.

11. The method of claim 1, wherein the pixels clue comprises pixel data obtained from a first block of a first reference picture and a second block of a second reference picture, wherein the first reference picture is different than the second reference picture, and wherein deriving the motion information comprises:

calculating a matching cost between the first block and the second block, wherein calculating the matching costs comprises:

applying a first weight to a first cost measurement for a first set of corresponding pixels of the first block and the second block; and

applying a second weight, different from the first weight, to a second cost measurement for a second set of corresponding pixels of the first block and the second block; and

refining the motion information based on the matching cost.

12. The method of claim 11, further comprising:

determining the first weight based on a distance between the first set of corresponding pixels and a first specific point of the current block; and

determining the second weight based on a distance between the second set of corresponding pixels and a second specific point of the current block.

13. The method of claim 12, wherein the specific point comprises one of a centroid of the current block or a corner of the current block.

14. The method of claim 11, further comprising:

determining the first weight based on a distance between the first set of corresponding pixels and a first specific point of the pixels clue; and

determining the second weight based on a distance between the second set of corresponding pixels and a second specific point of the pixels clue.

15. The method of claim 14, wherein the specific point comprises one of a centroid of the current block or a corner of the current block.

16. The method of claim 11, further comprising:

determining the first weight based on at least one of a first row that includes the first set of corresponding pixels or a first column that includes the first set of corresponding pixels; and

determining the second weight based on at least one of a second row that includes the second set of corresponding pixels or a second column that includes the second set of corresponding pixels.

17. The method of claim 11, further comprising:

determining the first weight based on a first region that includes the first set of corresponding pixels; and

determining the second weight based on a second region that includes the second set of corresponding pixels.

18. The method of claim 1, wherein deriving the motion information comprises selectively applying DMVD to a partial set of motion vector candidates in a motion vector candidate list for the current block, the method further comprising determining that a motion vector of the motion information derived using DMVD differs from at least one motion vector candidate in the motion vector candidate list for the current block by a threshold prior to decoding the current block using the motion information.

19. The method of claim 1, further comprising iteratively refining the pixels clue using refined motion vectors, wherein iteratively refining comprises:

after deriving a refined motion vector, regenerating a bilateral template using the refined motion vector; and

performing a further motion vector refinement using the regenerated bilateral template.

20. The method of claim 1, further comprising applying one or more filters to the pixels clue prior to deriving the motion information from the pixels clue, wherein the one or more filters comprise one or more of a guided filter, a bilateral filter, a median filter, a smoothing filter, or an averaging filter.

21. The method of claim 1, wherein determining the pixels clue comprises generating the pixels clue using motion refinement, wherein motion refinement comprises one or more of bi-directional optical flow (BIO), frame-rate up-conversion (FRUC) template matching, or FRUC bilateral matching.

22. The method of claim 1, wherein deriving the motion information comprises deriving the motion information for a first color component of the current block, and wherein determining the pixels clue comprises generating the pixels clue using the first color component and a second color component.

23. The method of claim 1, wherein determining the pixels clue comprises generating the pixels clue to have a size greater than a size of the current block, wherein when a size of the current block is MxN, where M and N are integer values, generating the pixels clue comprises generating the pixels clue from (M+I)x(N+J) motion compensated blocks, wherein I and J are integer values.

24. The method of claim 1, wherein decoding the current block comprises:
predicting the current block using the motion information to form a predicted block;
decoding quantized transform coefficients of the current block;
inverse quantizing the quantized transform coefficients to produce transform coefficients;
inverse transforming the transform coefficients to produce a block of residual data; and
combining the predicted block and the block of residual data to form a decoded block.

25. The method of claim 1, further comprising encoding the current block prior to decoding the current block.

26. A device for decoding video data, the device comprising:

a memory configured to store video data; and

a video decoder implemented in circuitry and configured to:

determine that motion information of a current block of the video data is to be derived using decoder-side motion vector derivation (DMVD);

determine a pixels clue for the current block, the pixels clue comprising pixel data obtained from one or more groups of previously decoded pixels;

determine an inter-prediction direction for the motion information according to matching costs between different prediction directions, wherein the video decoder is configured to scale weighting costs associated with uni-prediction up by a scaling factor;

derive the motion information for the current block according to DMVD from the pixels clue, wherein the video decoder is configured to derive the motion information according to DMVD such that the motion information has the determined inter-prediction direction; and

decode the current block using the motion information.

27. The device of claim 26, wherein the video decoder is configured to generate the pixels clue using multiple hypothesis predictions from multiple motion compensated blocks.

28. The device of claim 26, wherein the pixels clue comprises pixel data obtained from a first block of a first reference picture and a second block of a second reference picture, wherein the first reference picture is different than the second reference picture, and wherein to derive the motion information, the video decoder is configured to:

calculate a matching cost between the first block and the second block, wherein to calculate the matching costs, the video decoder is configured to:

apply a first weight to a first cost measurement for a first set of corresponding pixels of the first block and the second block; and

apply a second weight, different from the first weight, to a second cost measurement for a second set of corresponding pixels of the first block and the second block; and

refine the motion information based on the matching cost.

29. The device of claim 26, wherein the video decoder is further configured to determine that a motion vector of the motion information derived using DMVD differs from other motion vector candidates in a motion vector candidate list for the current list by a threshold prior to decoding the current block using the motion information.

30. The device of claim 26, further comprising a video encoder including the video decoder, the video encoder implemented in circuitry.

31. The device of claim 26, further comprising a display configured to display the decoded video data.

32. The device of claim 26, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

33. A device for decoding video data, the device comprising:

means for determining that motion information of a current block of video data is to be derived using decoder-side motion vector derivation (DMVD);

means for determining a pixels clue for the current block, the pixels clue comprising pixel data obtained from one or more groups of previously decoded pixels;

means for determining an inter-prediction direction for the motion information according to matching costs between different prediction directions, wherein the means for determining the inter-prediction direction comprises means for scaling weighting costs associated with uni-prediction up by a scaling factor;

means for deriving the motion information for the current block according to DMVD from the pixels clue, wherein the means for deriving the motion information comprises means for deriving the motion information according to DMVD such that the motion information has the determined inter-prediction direction; and

means for decoding the current block using the motion information.

34. The device of claim 33, wherein the means for determining the pixels clue comprises means for generating the pixels clue using multiple hypothesis predictions from multiple motion compensated blocks.

35. The device of claim 33, wherein the pixels clue comprises pixel data obtained from a first block of a first reference picture and a second block of a second reference picture, wherein the first reference picture is different than the second reference picture, and wherein the means for deriving the motion information comprises:

means for calculating a matching cost between the first block and the second block, wherein the means for calculating the matching costs comprises:

means for applying a first weight to a first cost measurement for a first set of corresponding pixels of the first block and the second block; and

means for applying a second weight, different from the first weight, to a second cost measurement for a second set of corresponding pixels of the first block and the second block; and

means for refining the motion information based on the matching cost.

36. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause a processor to:

determine that motion information of a current block of video data is to be derived using decoder-side motion vector derivation (DMVD);

determine a pixels clue for the current block, the pixels clue comprising pixel data obtained from one or more groups of previously decoded pixels;

determine an inter-prediction direction for the motion information according to matching costs between different prediction directions, wherein the instructions that cause the processor to determine the inter-prediction direction comprise instructions that cause the processor to scale weighting costs associated with uni-prediction up by a scaling factor;

derive the motion information for the current block according to DMVD from the pixels clue, wherein the instructions that cause the processor to derive the motion information comprise instructions that cause the processor to derive the motion information according to DMVD such that the motion information has the determined inter-prediction direction; and

decode the current block using the motion information.

37. The non-transitory computer-readable storage medium of claim 36, wherein the instructions that cause the processor to determine the pixels clue comprise instructions that cause the processor to generate the pixels clue using multiple hypothesis predictions from multiple motion compensated blocks.

38. The non-transitory computer-readable storage medium of claim 36, wherein the pixels clue comprises pixel data obtained from a first block of a first reference picture and a second block of a second reference picture, wherein the first reference picture is different than the second reference picture, and wherein the instructions that cause the processor to derive the motion information comprise instructions that cause the processor to:

calculate a matching cost between the first block and the second block, wherein the instructions that cause the processor to calculate the matching costs comprise instructions that cause the processor to:

apply a first weight to a first cost measurement for a first set of corresponding pixels of the first block and the second block; and

apply a second weight, different from the first weight, to a second cost measurement for a second set of corresponding pixels of the first block and the second block; and

refine the motion information based on the matching cost.