CLAIMS

1. A method of decoding video data from an encoded video bitstream, the method comprising:

generating, using decoder-side motion vector derivation (DMVD), a plurality of derived motion vectors;

determining a first derived motion vector and a second derived motion vector from the plurality of derived motion vectors based on a cost metric, comprising:

determining that the first derived motion vector and the second derived motion vector satisfy at least one constraint on a relationship between the first derived motion vector and the second derived motion vector, the relationship comprising: the first derived motion vector and the second derived motion vector have a symmetric motion vector difference,

wherein determining that the first derived motion vector and the second derived motion vector have the symmetric motion vector difference comprises determining that:

L0_MV_X_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_X_Diff * (CURR _POC – L0_POC_Derived) or

L0_MV_Y_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_Y_Diff * (CURR _POC – L0_POC_Derived),

wherein:

L0_MV_X_Diff is an X component of a difference between a first initial motion vector and the first derived motion vector,

L0_MV_Y_Diff is a Y component of a difference between the first initial motion vector and the first derived motion vector,

L1_MV_X_Diff is an X component of a difference between a second initial motion vector and the second derived motion vector,

L1_MV_Y_Diff is a Y component of a difference between the second initial motion vector and the second derived motion vector,

CURR _POC is a current picture order count (POC) of a current picture,

L0_POC_Derived is a derived POC for a first list of motion vectors, and

L1_POC_Derived is a derived POC for a second list of motion vectors;

and

decoding a current block using the determined first derived motion vector and the second derived motion vector using bi-prediction.

2. The method of claim 1, wherein using DMVD to generate the plurality of derived motion vectors comprises using one of a Bi-directional Optical flow (BIO) process, a frame-rate up-conversion (FRUC) process, a Bilateral Matching process, a FRUC template matching process, or a bilateral template matching process.

3. The method of claim 1, further comprising:

determining whether a first initial motion vector in a motion vector candidate list and a second initial motion vector in the motion vector candidate list are before a current picture or are after the current picture,

wherein determining the first derived motion vector and the second derived motion vector from the plurality of derived motion vectors based on the cost metric is further based on the determination.

4. The method of claim 1, further comprising:

determining whether a first picture order count (POC) distance between a first reference picture associated with a first motion vector candidate list and a current picture is zero and a second POC distance between a second reference picture associated with a second motion vector candidate list and the current picture is zero,

wherein determining the first derived motion vector and the second derived motion vector from the plurality of derived motion vectors based on the cost metric is further based on the determination.

5. The method of claim 1, further comprising:

determining whether a first picture order count (POC) distance between a first reference picture associated with a first motion vector candidate list and a current picture is zero and a second POC distance between a second reference picture associated with a second motion vector candidate list and the current picture is zero,

wherein determining the first derived motion vector and the second derived motion vector from the plurality of derived motion vectors based on the cost metric is further based on the determination.

6. The method of claim 1, further comprising:

determining the at least one constraint from the encoded video bitstream.

7. The method of claim 1, wherein the cost metric includes a sum of absolute differences.

8. An apparatus configured to decode video data from an encoded video bitstream, the apparatus comprising:

a memory configured to store the video data; and

one or more processors in communication with the memory, the one or more processors configured to:

generate, using decoder-side motion vector derivation (DMVD), a plurality of derived motion vectors;

determine a first derived motion vector and a second derived motion vector from the plurality of derived motion vectors based on a cost metric, comprising:

a determination that the first derived motion vector and the second derived motion vector satisfy at least one constraint on a relationship between the first derived motion vector and the second derived motion vector, the relationship comprising: the first derived motion vector and the second derived motion vector have a symmetric motion vector difference,

wherein the determination that the first derived motion vector and the second derived motion vector have the symmetric motion vector difference comprises a determination that:

L0_MV_X_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_X_Diff * (CURR _POC – L0_POC_Derived) or

L0_MV_Y_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_Y_Diff * (CURR _POC – L0_POC_Derived),

wherein:

L0_MV_X_Diff is an X component of a difference between a first initial motion vector and the first derived motion vector,

L0_MV_Y_Diff is a Y component of a difference between the first initial motion vector and the first derived motion vector,

L1_MV_X_Diff is an X component of a difference between a second initial motion vector and the second derived motion vector,

L1_MV_Y_Diff is a Y component of a difference between the second initial motion vector and the second derived motion vector,

CURR _POC is a current picture order count (POC) of a current picture,

L0_POC_Derived is a derived POC for a first list of motion vectors, and

L1_POC_Derived is a derived POC for a second list of motion vectors; and

decode a current block using the determined first derived motion vector and the second derived motion vector using bi-prediction.

9. The apparatus of claim 8, wherein using DMVD to generate the plurality of derived motion vectors comprises using one of a Bi-directional Optical flow (BIO) process, a frame-rate up-conversion (FRUC) process, a Bilateral Matching process, a FRUC template matching process, or a bilateral template matching process.

10. The apparatus of claim 8, wherein the one or more processors are further configured to:

determine whether a first initial motion vector in a motion vector candidate list and a second initial motion vector in the motion vector candidate list are before a current picture or are after the current picture,

wherein determining the first derived motion vector and the second derived motion vector from the plurality of derived motion vectors based on the cost metric is further based on the determination.

11. The apparatus of claim 8, wherein the one or more processors are further configured to:

determine whether a first picture order count (POC) distance between a first reference picture associated with a first motion vector candidate list and a current picture is zero and a second POC distance between a second reference picture associated with a second motion vector candidate list and the current picture is zero,

wherein determining the first derived motion vector and the second derived motion vector from the plurality of derived motion vectors based on the cost metric is further based on the determination.

12. The apparatus of claim 8, wherein the one or more processors are further configured to:

determine whether a first picture order count (POC) distance between a first reference picture associated with a first motion vector candidate list and a current picture is zero and a second POC distance between a second reference picture associated with a second motion vector candidate list and the current picture is zero,

wherein determining the first derived motion vector and the second derived motion vector from the plurality of derived motion vectors based on the cost metric generating the plurality of derived motion vectors is further based on the determining the first POC distance between the first reference picture associated with the first motion vector candidate list and the current picture is zero and the second POC distance between the second reference picture associated with the second motion vector candidate list and the current picture is zero determination.

13. The apparatus of claim 8, wherein the one or more processors are further configured to determine the at least one constraint from the encoded video bitstream.

14. The apparatus of claim 8, wherein the cost metric includes a sum of absolute differences.

15. An apparatus configured to decode video data from an encoded video bitstream, the apparatus comprising:

means for generating, using decoder-side motion vector derivation (DMVD), a plurality of derived motion vectors;

means for determining a first derived motion vector and a second derived motion vector from the plurality of derived motion vectors based on a cost metric, comprising:

means for determining that the first derived motion vector and the second derived motion vector satisfy at least one constraint on a relationship between the first derived motion vector and the second derived motion vector, the relationship comprising: the first derived motion vector and the second derived motion vector have a symmetric motion vector difference,

wherein the means for determining that the first derived motion vector and the second derived motion vector have the symmetric motion vector difference comprises means for determining that:

L0_MV_X_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_X_Diff * (CURR _POC – L0_POC_Derived) or

L0_MV_Y_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_Y_Diff * (CURR _POC – L0_POC_Derived),

wherein:

L0_MV_X_Diff is an X component of a difference between a first initial motion vector and the first derived motion vector,

L0_MV_Y_Diff is a Y component of a difference between the first initial motion vector and the first derived motion vector,

L1_MV_X_Diff is an X component of a difference between a second initial motion vector and the second derived motion vector,

L1_MV_Y_Diff is a Y component of a difference between the second initial motion vector and the second derived motion vector,

CURR _POC is a current picture order count (POC) of a current picture,

L0_POC_Derived is a derived POC for a first list of motion vectors, and

L1_POC_Derived is a derived POC for a second list of motion vectors; and

means for decoding a current block using the determined first derived motion vector and the second derived motion vector using bi-prediction.

16. The apparatus of claim 15, wherein using DMVD to generate the plurality of derived motion vectors comprises using one of a Bi-directional Optical flow (BIO) process, a frame-rate up-conversion (FRUC) process, a Bilateral Matching process, a FRUC template matching process, or a bilateral template matching process.

17. An apparatus configured to encode video data, the apparatus comprising:

a memory configured to store the video data; and

one or more processors in communication with the memory, the one or more processors configured to:

generate, using decoder-side motion vector derivation (DMVD), a plurality of derived motion vectors;

determine a first derived motion vector and a second derived motion vector from the plurality of derived motion vectors based on a cost metric, comprising:

a determination that the first derived motion vector and the second derived motion vector satisfy at least one constraint on a relationship between the first derived motion vector and the second derived motion vector, the relationship comprising: the first derived motion vector and the second derived motion vector have a symmetric motion vector difference,

wherein the determination that the first derived motion vector and the second derived motion vector have the symmetric motion vector difference comprises a determination that:

L0_MV_X_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_X_Diff * (CURR _POC – L0_POC_Derived) or

L0_MV_Y_Diff * (CURR _POC - L1_POC_Derived) = L1_MV_Y_Diff * (CURR _POC – L0_POC_Derived),

wherein:

L0_MV_X_Diff is an X component of a difference between a first initial motion vector and the first derived motion vector,

L0_MV_Y_Diff is a Y component of a difference between the first initial motion vector and the first derived motion vector,

L1_MV_X_Diff is an X component of a difference between a second initial motion vector and the second derived motion vector,

L1_MV_Y_Diff is a Y component of a difference between the second initial motion vector and the second derived motion vector,

CURR _POC is a current picture order count (POC) of a current

picture,

L0_POC_Derived is a derived POC for a first list of motion vectors, and

L1_POC_Derived is a derived POC for a second list of motion vectors; and

encode a current block using the determined first derived motion vector and the second derived motion vector using bi-prediction.

18. The apparatus of claim 17, wherein using DMVD to generate the plurality of derived motion vectors comprises using one of a Bi-directional Optical flow (BIO) process, a frame-rate up-conversion (FRUC) process, a Bilateral Matching process, a FRUC template matching process, or a bilateral template matching process.