SIMPLIFIED INTER PREDICTION WITH GEOMETRIC PARTITIONING

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on International Patent Application No. PCT/CN2020/132162, filed on November 27, 2020, which claims the priority to and benefits of International Patent Application No. PCT/CN2019/122256, filed on November 30, 2019, International Patent Application No. PCT/CN2020/071032, filed on January 8, 2020, and International Patent Application No. PCT/CN2020/071552, filed on January 10, 2020. All the aforementioned patent applications are hereby incorporated by reference in their entireties.

TECHNICAL FIELD

[0002] This patent document relates to video coding and decoding techniques, devices and systems.

BACKGROUND

[0003] Currently, efforts are underway to improve the performance of current video codec technologies to provide better compression ratios or provide video coding and decoding schemes that allow for lower complexity or parallelized implementations. Industry experts have recently proposed several new video coding tools and tests are currently underway for determining their effectivity.

SUMMARY

[0004] Devices, systems and methods related to digital video coding, and specifically, to management of motion vectors are described. The described methods may be applied to existing video coding standards (e.g., High Efficiency Video Coding (HEVC) or Versatile Video Coding) and future video coding standards or video codecs.

[0005] In one representative aspect, the disclosed technology may be used to provide a method for video processing. This method includes performing a conversion between a current video block of a video and a bitstream representation of the video, wherein, during the conversion, a use of a geometric partitioning mode is allowed for the current video block, and wherein parameters of the geometric partitioning mode are computed using a set of angles including a first number of angles that is less than a first threshold value and/or a set of distances including a second number of distances that is less than a second threshold value.

CLAIMS

What is claimed is:

1. A method of processing video data, comprising:

performing a conversion between a current video block of a video and a bitstream of the video,

wherein, during the conversion, a use of a geometric partitioning mode is allowed for the current video block, and the geometric partitioning mode includes multiple partition schemes,

wherein parameters of the multiple partition schemes of the geometric partitioning mode are computed using a set of angles including a first number of angles that is less than a first threshold value and a set of distances for the set of angles including a second number of distances that is less than a second threshold value, and

wherein a number of distances for a vertical angle and a horizontal angle is equal to X, whereby X is equal to 2.

2. The method of claim 1, wherein the first threshold value is equal to 24.

3. The method of claim 1 or 2, wherein the first number is equal to 20.

4. The method of any of claims 1-3, wherein a number of the multiple partition schemes is less than a third threshold value, wherein the third threshold value is equal to 82.

5. The method of any of claims 1-4, further comprising determining, for the current video block, a first motion information and a second motion information,

wherein the conversion is based on the first motion information and the second motion information, wherein the conversion comprises applying a weighting process to generate a final prediction for the current video block based on a weighted sum of prediction samples derived from the first motion information and the second motion information, and

wherein a calculation of a first variable used in the weighting process for the current video block depends on a total number of minimum angle unit in a 360 degree used in the geometric partitioning mode.

6. The method of claim 5, wherein the first variable denoted as displacementY is set to (displacementX+(the total number of minimum angle unit>>2))) % the total number of minimum angle unit, and wherein the displacementX is set to angleIdx specifying an angle index of a partition scheme of the geometric partitioning mode.

7. The method of claim 5 or 6, wherein a calculation of a second variable of shiftHor used in the weighting process depends on the total number of minimum angle unit, whereby the shiftHor is set to 0 or 1.

8. The method of claim 7, wherein the shiftHor is set to 0 in a case that at least one of following conditions is met:

1) angleIdx % (the total number of minimum angle unit/2) is equal to (the total number of minimum angle unit>>2); or

2) angleIdx % (the total number of minimum angle unit/2) is not equal to 0 and hwRatio $\geqslant$ 1, wherein hwRatio is set to H/W,

wherein angleIdx specifies an angle index of a partition scheme of the geometric partitioning mode, and H and W are height and width of the current video block, respectively.

9. The method of any of claims 1-8, wherein in response to a width to height ratio or a height to width ratio of the current video block being greater than a fourth threshold, or in response to a width or a height of the current video block being smaller than a fifth threshold, the geometric partitioning mode is not allowed for the current video block.

10. The method of any of claims 1-9, wherein when a syntax element for the geometric partitioning mode is not present in the bitstream, a value of the syntax element is inferred to be a default value equal to 0, wherein the syntax element includes at least one of a first syntax element specifying a partition scheme of the geometric partitioning mode, a second syntax element specifying

a first merging candidate index of the geometric partitioning mode, or a third syntax element specifying a second merging candidate index of the geometric partitioning mode.

11. The method of any of claims 1-10, wherein the conversion includes encoding the video into the bitstream.

12. The method of any of claims 1-10, wherein the conversion includes decoding the video from the bitstream.

13. An apparatus for processing video data comprising a processor and a non-transitory memory with instructions thereon, wherein the instructions upon execution by the processor, cause the processor to:

perform a conversion between a current video block of a video and a bitstream of the video,

wherein, during the conversion, a use of a geometric partitioning mode is allowed for the current video block, and the geometric partitioning mode includes multiple partition schemes,

wherein parameters of the multiple partition schemes of the geometric partitioning mode are computed using a set of angles including a first number of angles that is less than a first threshold value and a set of distances for the set of angles including a second number of distances that is less than a second threshold value, and

wherein a number of distances for a vertical angle and a horizontal angle is equal to X, whereby X is equal to 2.

14. The apparatus of claim 13, wherein the first threshold value is equal to 24;

wherein the first number is equal to 20;

wherein a number of the multiple partition schemes is less than a third threshold value, wherein the third threshold value is equal to 82;

wherein in response to a width to height ratio or a height to width ratio of the current video block being greater than a fourth threshold, or in response to a width or a height of the current video block being smaller than a fifth threshold, the geometric partitioning mode is not allowed for the current video block; and

wherein when a syntax element for the geometric partitioning mode is not present in the bitstream, a value of the syntax element is inferred to be a default value equal to 0, wherein the syntax element includes at least one of a first syntax element specifying a partition scheme of the geometric partitioning mode, a second syntax element specifying a first merging candidate index of the geometric partitioning mode, or a third syntax element specifying a second merging candidate index of the geometric partitioning mode.

15. The apparatus of claim 13 or 14, wherein the processor is further caused to determine, for the current video block, a first motion information and a second motion information,

wherein the conversion is based on the first motion information and the second motion information, wherein the conversion comprises applying a weighting process to generate a final prediction for the current video block based on a weighted sum of prediction samples derived from the first motion information and the second motion information,

wherein a calculation of a first variable used in the weighting process for the current video block depends on a total number of minimum angle unit in a 360 degree used in the geometric partitioning mode;

wherein the first variable denoted as displacementY is set to (displacementX+(the total number of minimum angle unit>>2))) % the total number of minimum angle unit, and wherein the displacementX is set to angleIdx specifying an angle index of a partition scheme of the geometric partitioning mode;

wherein a calculation of a second variable of shiftHor used in the weighting process depends on the total number of minimum angle unit, whereby the shiftHor is set to 0 or 1; and

wherein the shiftHor is set to 0 in a case that at least one of following conditions is met:

1) angleIdx % (the total number of minimum angle unit/2) is equal to (the total number of minimum angle unit>>2); or

2) angleIdx % (the total number of minimum angle unit/2) is not equal to 0 and hwRatio $\geqslant$ 1, wherein hwRatio is set to H/W,

wherein angleIdx specifies an angle index of a partition scheme of the geometric partitioning mode, and H and W are height and width of the current video block, respectively.

16. A non-transitory computer-readable storage medium storing instructions that cause a processor to:

perform a conversion between a current video block of a video and a bitstream of the video,

wherein, during the conversion, a use of a geometric partitioning mode is allowed for the current video block, and the geometric partitioning mode includes multiple partition schemes,

wherein parameters of the multiple partition schemes of the geometric partitioning mode are computed using a set of angles including a first number of angles that is less than a first threshold value and a set of distances for the set of angles including a second number of distances that is less than a second threshold value, and

wherein a number of distances for a vertical angle and a horizontal angle is equal to X, whereby X is equal to 2.

17. The non-transitory computer-readable storage medium of claim 16, wherein the first threshold value is equal to 24;

wherein the first number is equal to 20;

wherein a number of the multiple partition schemes is less than a third threshold value, wherein the third threshold value is equal to 82;

wherein in response to a width to height ratio or a height to width ratio of the current video block being greater than a fourth threshold, or in response to a width or a height of the current video block being smaller than a fifth threshold, the geometric partitioning mode is not allowed for the current video block; and

wherein when a syntax element for the geometric partitioning mode is not present in the bitstream, a value of the syntax element is inferred to be a default value equal to 0, wherein the syntax element includes at least one of a first syntax element specifying a partition scheme of the geometric partitioning mode, a second syntax element specifying a first merging candidate index of the geometric partitioning mode, or a third syntax element specifying a second merging candidate index of the geometric partitioning mode.

18. The non-transitory computer-readable storage medium of claim 16 or 17, wherein the processor is further caused to determine, for the current video block, a first motion information and a second motion information,

wherein the conversion is based on the first motion information and the second motion information, wherein the conversion comprises applying a weighting process to generate a final prediction for the current video block based on a weighted sum of prediction samples derived from the first motion information and the second motion information,

wherein a calculation of a first variable used in the weighting process for the current video block depends on a total number of minimum angle unit in a 360 degree used in the geometric partitioning mode;

wherein the first variable denoted as displacementY is set to (displacementX+(the total number of minimum angle unit>>2))) % the total number of minimum angle unit, and wherein the displacementX is set to angleIdx specifying an angle index of a partition scheme of the geometric partitioning mode;

wherein a calculation of a second variable of shiftHor used in the weighting process depends on the total number of minimum angle unit, whereby the shiftHor is set to 0 or 1; and

wherein the shiftHor is set to 0 in a case that at least one of following conditions is met:

1) angleIdx % (the total number of minimum angle unit/2) is equal to (the total number of minimum angle unit>>2); or

2) angleIdx % (the total number of minimum angle unit/2) is not equal to 0 and hwRatio $\geqslant$ 1, wherein hwRatio is set to H/W,

wherein angleIdx specifies an angle index of a partition scheme of the geometric partitioning mode, and H and W are height and width of the current video block, respectively.

19. A non-transitory computer-readable recording medium storing a bitstream of a video which is generated by a method performed by a video processing apparatus, wherein the method comprises:

generating the bitstream for a current video block of a video,

wherein, during the generating, a use of a geometric partitioning mode is allowed for the current video block, and the geometric partitioning mode includes multiple partition schemes,

wherein parameters of the multiple partition schemes of the geometric partitioning mode are computed using a set of angles including a first number of angles that is less than a first threshold value and a set of distances for the set of angles including a second number of distances that is less than a second threshold value, and

wherein a number of distances for a vertical angle and a horizontal angle is equal to X, whereby X is equal to 2.

20. The non-transitory computer-readable recording medium of claim 19, wherein the first threshold value is equal to 24;

wherein the first number is equal to 20;

wherein a number of the multiple partition schemes is less than a third threshold value, wherein the third threshold value is equal to 82;

wherein in response to a width to height ratio or a height to width ratio of the current video block being greater than a fourth threshold, or in response to a width or a height of the current video block being smaller than a fifth threshold, the geometric partitioning mode is not allowed for the current video block; and

wherein when a syntax element for the geometric partitioning mode is not present in the bitstream, a value of the syntax element is inferred to be a default value equal to 0, wherein the syntax element includes at least one of a first syntax element specifying a partition scheme of the geometric partitioning mode, a second syntax element specifying a first merging candidate index of the geometric partitioning mode, or a third syntax element specifying a second merging candidate index of the geometric partitioning mode;

wherein the method further comprises determining, for the current video block, a first motion information and a second motion information,

wherein the conversion is based on the first motion information and the second motion information, wherein the conversion comprises applying a weighting process to generate a final prediction for the current video block based on a weighted sum of prediction samples derived from the first motion information and the second motion information,

wherein a calculation of a first variable used in the weighting process for the current video block depends on a total number of minimum angle unit in a 360 degree used in the geometric partitioning mode;

wherein the first variable denoted as displacementY is set to (displacementX+(the total number of minimum angle unit>>2))) % the total number of minimum angle unit, and wherein the displacementX is set to angleIdx specifying an angle index of a partition scheme of the geometric partitioning mode;

wherein a calculation of a second variable of shiftHor used in the weighting process depends on the total number of minimum angle unit, whereby the shiftHor is set to 0 or 1; and

wherein the shiftHor is set to 0 in a case that at least one of following conditions is met:

1) angleIdx % (the total number of minimum angle unit/2) is equal to (the total number of minimum angle unit>>2); or

2) angleIdx % (the total number of minimum angle unit/2) is not equal to 0 and hwRatio $\geqslant$ 1, wherein hwRatio is set to H/W,

wherein angleIdx specifies an angle index of a partition scheme of the geometric partitioning mode, and H and W are height and width of the current video block, respectively.