ENTROPY CODING FOR MOTION PRECISION SYNTAX

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application is based on International Patent Application PCT/CN2021/091869, filed on May 6, 2021, which claims~~Under the applicable patent law and/or rules pursuant to the Paris Convention, this application is made to timely claim~~ the priority to and benefits of International Patent Application No. PCT/CN2020/088546, filed on May 1, 2020. All the aforementioned patent applications are hereby incorporated by reference in their entireties~~For all purposes under the law, the entire disclosure of the aforementioned application is incorporated by reference as part of the disclosure of this application~~.

TECHNICAL FIELD

[001] This document is related to video and image coding technologies.

BACKGROUND

[002] Digital video accounts for the largest bandwidth use on the internet and other digital communication networks. As the number of connected user devices capable of receiving and displaying video increases, it is expected that the bandwidth demand for digital video usage will continue to grow.

SUMMARY

[003] The disclosed techniques may be used by video or image decoder or encoder embodiments for performing encoding or decoding using context based coding and decoding.

[004] In one example aspect, a method of processing video is disclosed. The method includes performing a conversion between a video block of a video and a coded representation of the video, wherein the coded representation conforms to a format rule, wherein the conversion is based on an adaptive motion vector difference resolution (AMVR) tool in which a representation of a motion vector or a motion vector difference or a motion vector predictor for the video block is represented in the coded representation using an adaptive resolution; wherein the format rule specifies to represent use of the adaptive resolution in the coded representation by context modeling that is dependent on a coded information of the video block or a neighboring block of the video block.

[005] In another example aspect, another method of processing video is disclosed. The method includes performing a conversion between a video block of a video and a coded representation of

the video, wherein the coded representation conforms to a format rule, wherein the conversion is based on an adaptive motion vector difference resolution (AMVR) tool in which a representation

CLAIMS

1. A video processing method, comprising:

performing a conversion between a block of a video and a bitstream of the video according to a rule,

wherein the conversion is based on an adaptive motion vector difference resolution (AMVR) tool, and wherein the rule specifies that selection of a context for a first bin within a bin string of a first syntax element that specifies the resolution of the motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the block.

2. The method of claim 1, wherein the block is a coding unit.

3. The method of claim 1 or 2, wherein the coding mode for the block is one of an affine inter mode, an intra block copy mode, or a normal inter mode which is a non-affine inter mode.

4. The method of any of claims 1 to 3, wherein multiple contexts corresponding to different coding modes are applicable to the first bin.

5. The method of claim 4, wherein the multiple contexts include three contexts.

6. The method of claim 4, wherein each coding mode corresponds to a single context.

7. The method of any of claims 1 to 6, wherein a first context for the first bin is assigned a first value in case the block is coded using the IBC mode, and wherein at least one context different from the first context is applicable to the first bin for at least one inter coding mode in case the block is not coded using the IBC mode.

8. The method of claim 1 to 7, wherein a second context for the first bin is assigned a second value in case the block is coded using an affine inter mode, and wherein a third context for the first bin is assigned a third value in case the block is coded using a normal inter mode which is a non-affine inter mode, wherein the second value and the third value are different from each other.

1. A video processing method, comprising:

performing a conversion between a first block of a video and a bitstream of the video according to a rule,

wherein the conversion is based on an adaptive motion vector resolution (AMVR) tool,

wherein the rule specifies that selection of a context increasement (ctxInc) for a first bin within a bin string of a first syntax element that specifies a resolution of motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the first block, and

wherein the coding mode for the first block is one of an affine inter mode, an intra block copy (IBC) mode, or a normal inter mode which is a non-affine inter mode.

2. The method of claim 1, wherein the first block is a coding unit.

3. The method of claim 1 or 2, wherein three different context increasements corresponding to the three different coding modes are applicable to the first bin, and each coding mode corresponds to a single context increasement.

4. The method of claim 3, wherein a first context increasement is assigned for the first bin in case the first block is coded using the IBC mode, a second context increasement is assigned for the first bin in case that the first block is coded using the affine inter mode, and a third context increasement is assigned for the first bin in case that the first block is coded using the normal inter mode.

5. The method of claim 4, wherein the first context increasement is equal to 1, the second context increasement is equal to 2, and the third context increasement is equal to 0.

6. The method of any one of claims 1-5, wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a second bin of the bin string of the first syntax element for a second block which is coded using the normal inter mode.

9. The method of any of claims 1 to 8, wherein a context of a second bin of the bin string is same as one or more of contexts used for the first bin.

10. The method of any of claims 1 to 9, wherein a second bin of the bin string is coded with a single context value.

11. The method of claim 10, wherein the same context is selected for the first bin of the bin string for a first block which is coded using an IBC mode and the second bin of the bin string for a second block which is coded using a normal inter mode which is a non-affine inter mode.

12. The method of any of claims 1 to 11, wherein, in case the block is coded using an IBC mode or an affine inter mode, the bin string consists of the first bin, and wherein, in case the block is coded using a normal inter mode which is a non-affine inter mode, the bin string further comprises a second bin.

13. The method of any of claims 4 to 9, wherein at least one of the multiple contexts applicable to the first bin is same as at least one context selected for a second syntax element that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element.

14. The method of claim 13, wherein, in case the block is coded using the IBC mode, the context for the first syntax element that specifies the resolution of the motion vector difference is same as the context selected for the second syntax element that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element.

15. The method of claim 13, wherein, in case the block is not coded using the IBC mode or the affine mode, the context for the first syntax element that specifies the resolution of the motion vector difference is same as the context selected for the second syntax element that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element.

7. The method of any one of claims 1-5, wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a bin of a second syntax element for a third block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the third block is coded using the affine inter mode.

8. The method of any one of claims 1-5, wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the normal inter mode and a bin of a second syntax element for a fourth block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the fourth block is not coded using the affine inter mode.

9. The method of any one of claims 1-8, wherein in an initialization process, a value of a context index for the first syntax element is in a range from 0 to 2 in case that a context initialization type is a first type, the value of the context index for the first syntax element is in a range from 3 to 5 in case that the context initialization type is a second type, and the value of the context index for the first syntax element is in a range from 6 to 8 in case that the context initialization type is a third type.

10. The method of any one of claims 1-9, wherein the conversion comprises encoding the video into the bitstream.

11. The method of any one of claims 1-9, wherein the conversion comprises decoding the video from the bitstream.

12. 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 first block of a video and a bitstream of the video according to a rule,

16. The method of claim 14 or 15, wherein the context for the first bin within the bin string is assigned a value of CtxM, and a context for the second bin with the bin string is assigned a value of CtxQ, and wherein CtxM = CtxQ.

17. The method of claim 16, wherein a different context is selected for the second bin as compared to the first bin.

18. The method of claim 4, wherein a first context for the first bin in case the block is coded in the IBC mode, a second context for the first bin in case the block is coded using the affine mode, and a third context for the first bin in case the block is coded using neither the IBC mode nor the affine mode are same.

19. The method of claim 4, wherein a first context for the first bin in case the block is coded in the IBC mode and a second context for the first bin in case the block is coded using neither the IBC mode nor the affine mode are same are same.

20. The method of claim 19, wherein a third context for the first bin in case the block is coded using the affine mode is different from the first context and the second context.

21. The method of claim 4, wherein a first context for the first bin in case the block is coded in the IBC mode and a second context for the first bin in case the block is coded using the affine mode are same.

22. The method of claim 4, wherein contexts for all bins within the bin string in case the block is coded in the IBC mode, contexts for all bins within the bin string in case the block is coded using the affine mode, and contexts for all bins within the bin string in case the block is coded using neither the IBC mode nor the affine mode are same.

23. The method of any of claims 1 to 22, wherein the AMVR tool is a coding tool in which a resolution of a motion vector difference is adaptively adjusted on a block-by-block basis.

wherein the conversion is based on an adaptive motion vector resolution (AMVR) tool,

wherein the rule specifies that selection of a context increasement (ctxInc) for a first bin within a bin string of a first syntax element that specifies a resolution of motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the first block, and wherein the coding mode for the first block is one of an affine inter mode, an intra block copy (IBC) mode, or a normal inter mode which is a non-affine inter mode.

13. The apparatus of claim 12, wherein the first block is a coding unit.

14. The apparatus of claim 12 or 13, wherein three different context increasements corresponding to the three different coding modes are applicable to the first bin, and each coding mode corresponds to a single context increasement;

wherein a first context increasement is assigned for the first bin in case that the first block is coded using the IBC mode, a second context increasement is assigned for the first bin in case that the first block is coded using the affine inter mode, and a third context increasement is assigned for the first bin in case that he first block is coded using the normal inter mode; and

wherein the first context increasement is equal to 1, the second context increasement is equal to 2, and the third context increasement is equal to 0.

15. The apparatus of any one of claims 12-14, wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a second bin of the bin string of the first syntax element for a second block which is coded using the normal inter mode;

wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a bin of a second syntax element for a third block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the third block is coded using the affine inter mode; or

wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the normal inter mode and a bin of a second syntax element for a fourth block that specifies whether the resolution of the

24. The method of any of claims 1 to 23, wherein the conversion comprises encoding the video into the bitstream.

25. The method of any of claims 1 to 23, wherein the conversion comprises decoding the video from the bitstream.

26. A method for storing bitstream of a video, comprising:
generating a bitstream of the video from a block of the video according to a rule,
wherein the generating comprises using an adaptive motion vector difference resolution (AMVR) tool in which a motion vector difference is represented in the bitstream using a resolution of the motion vector difference, and
wherein the rule specifies that selection of a context for a first bin within a bin string of a first syntax element that specifies the resolution of the motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the block.

27. A video decoding apparatus comprising a processor configured to implement a method recited in one or more of claims 1 to 26.

28. A video encoding apparatus comprising a processor configured to implement a method recited in one or more of claims 1 to 26.

29. A computer program product having computer code stored thereon, the code, when executed by a processor, causes the processor to implement a method recited in any of claims 1 to 26.

30. 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 a bitstream of the video from a block of the video according to a rule, and
storing the bitstream in a non-transitory computer-readable recording medium,

motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the fourth block is not coded using the affine inter mode.

16. The apparatus of any one of claims 12-15, wherein in an initialization process, a value of a context index for the first syntax element is in a range from 0 to 2 in case that a context initialization type is a first type, the value of the context index for the first syntax element is in a range from 3 to 5 in case that the context initialization type is a second type, and the value of the context index for the first syntax element is in a range from 6 to 8 in case that the context initialization type is a third type.

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

perform a conversion between a first block of a video and a bitstream of the video according to a rule,

wherein the conversion is based on an adaptive motion vector resolution (AMVR) tool,

wherein the rule specifies that selection of a context increasement (ctxInc) for a first bin within a bin string of a first syntax element that specifies a resolution of motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the first block, and wherein the coding mode for the first block is one of an affine inter mode, an intra block copy (IBC) mode, or a normal inter mode which is a non-affine inter mode.

18. The non-transitory computer-readable storage medium of claim 17, wherein the first block is a coding unit;

wherein three different context increasements corresponding to the three different coding modes are applicable to the first bin, and each coding mode corresponds to a single context increasement;

wherein a first context increasement is assigned for the first bin in case that the first block is coded using the IBC mode, a second context increasement is assigned for the first bin in case that the first block is coded using the affine inter mode, and a third context increasement is assigned for the first bin in case that he first block is coded using the normal inter mode; and

wherein the generating comprises using an adaptive motion vector difference resolution (AMVR) tool in which a motion vector difference is represented in the bitstream using a resolution of the motion vector difference, and

wherein the rule specifies that selection of a context for a first bin within a bin string of a first syntax element that specifies the resolution of the motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the block.

31. A method, apparatus or system described in the present document.

wherein the first context increasement is equal to 1, the second context increasement is equal to 2, and the third context increasement is equal to 0;

wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a second bin of the bin string of the first syntax element for a second block which is coded using the normal inter mode; a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a bin of a second syntax element for a third block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the third block is coded using the affine inter mode; or a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the normal inter mode and a bin of a second syntax element for a fourth block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the fourth block is not coded using the affine inter mode; and

wherein in an initialization process, a value of a context index for the first syntax element is in a range from 0 to 2 in case that a context initialization type is a first type, the value of the context index for the first syntax element is in a range from 3 to 5 in case that the context initialization type is a second type, and the value of the context index for the first syntax element is in a range from 6 to 8 in case that the context initialization type is a third type.

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 of a first block of a video according to a rule,

wherein the generating is based on an adaptive motion vector resolution (AMVR) tool,

wherein the rule specifies that selection of a context increasement (ctxInc) for a first bin within a bin string of a first syntax element that specifies a resolution of motion vector difference associated with an AMVR shift is derived based on usage of a coding mode for the first block, and wherein the coding mode for the first block is one of an affine inter mode, an intra block copy (IBC) mode, or a normal inter mode which is a non-affine inter mode.

20. The non-transitory computer-readable recording medium of claim 19, wherein the first block is a coding unit;

wherein three different context increasements corresponding to the three different coding modes are applicable to the first bin, and each coding mode corresponds to a single context increasement;

wherein a first context increasement is assigned for the first bin in case that the first block is coded using the IBC mode, a second context increasement is assigned for the first bin in case that the first block is coded using the affine inter mode, and a third context increasement is assigned for the first bin in case that he first block is coded using the normal inter mode; and

wherein the first context increasement is equal to 1, the second context increasement is equal to 2, and the third context increasement is equal to 0;

wherein a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a second bin of the bin string of the first syntax element for a second block which is coded using the normal inter mode; a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the IBC mode and a bin of a second syntax element for a third block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the third block is coded using the affine inter mode; or a same context increasement is used for the first bin of the bin string of the first syntax element for the first block in case that the first block is coded using the normal inter mode and a bin of a second syntax element for a fourth block that specifies whether the resolution of the motion vector difference is 1/4 of a luma sample or is specified by the first syntax element, and wherein the fourth block is not coded using the affine inter mode; and

wherein in an initialization process, a value of a context index for the first syntax element is in a range from 0 to 2 in case that a context initialization type is a first type, the value of the context index for the first syntax element is in a range from 3 to 5 in case that the context initialization type is a second type, and the value of the context index for the first syntax element is in a range from 6 to 8 in case that the context initialization type is a third type.