

Selection and Signaling of Motion Vector (MV) Precisions

CROSS-REFERENCE TO RELATED APPLICATIONS

[1] This application claims priority to United States non-provisional patent application Serial No. 15/982,865 filed on May 17, 2018, and entitled “Selection and Signaling of Motion Vector (MV) Precisions,” which in turn claims priority to United States provisional patent application number 62/518,402 filed on June 12, 2017 by Futurewei Technologies, Inc. and titled “Motion Vector Prediction and Merge Candidate Selection,” which is incorporated by reference.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[2] Not applicable.

REFERENCE TO A MICROFICHE APPENDIX

[3] Not applicable.

BACKGROUND

[4] Videos use a relatively large amount of data, so communication of videos uses a relatively large amount of bandwidth. However, many networks operate at or near their bandwidth capacities. In addition, customers demand high video qualities, which require using even more data. There is therefore a desire to both reduce the amount of data videos use and improve the video qualities. One solution is to compress videos during an encoding process and decompress the videos during a decoding process. Improving compression and decompression techniques is a focus of research and development.

SUMMARY

[5] According to one aspect of the present disclosure, there is provided an apparatus comprising: a memory; and a processor coupled to the memory and configured to: obtain a current block of a video frame, obtain candidate MVs corresponding to neighboring blocks of the video frame, the neighboring blocks neighbor the current block, obtain precisions of the candidate MVs, perform first rounding of the precisions based on a rounding scheme, perform

CLAIMS

What is claimed is:

1. An apparatus comprising:
a memory; and
a processor coupled to the memory and configured to:
 obtain a current block of a video frame,
 obtain candidate motion vectors (MVs) corresponding to neighboring blocks of the video frame, wherein the neighboring blocks neighbor the current block,
 obtain precisions of the candidate MVs,
 perform first rounding of the precisions based on a rounding scheme,
 perform second rounding of the candidate MVs based on the first rounding,
 perform pruning of the candidate MVs, and
 generate a candidate list based on the second rounding and the pruning.
2. The apparatus of claim 1, wherein the neighboring blocks comprise a first neighboring block and a second neighboring block, and wherein the precisions comprise a first precision of the first neighboring block and a second precision of the second neighboring block.
3. The apparatus of claim 2, wherein the rounding scheme comprises:
 rounding the first precision to a target precision of the current block; and
 rounding the second precision to the target precision.
4. The apparatus of claim 2, wherein the rounding scheme comprises:
 determining a lowest precision from among any combination of the first precision, the second precision, and a target precision of the current block; and
 rounding at least one of the first precision, the second precision, or the target precision to the lowest precision.

5. The apparatus of claim 2, wherein the rounding scheme comprises:
determining a median precision from among any combination of the first precision, the second precision, and a target precision of the current block; and
rounding at least one of the first precision, the second precision, or the target precision to the median precision.
6. The apparatus of claim 2, wherein the rounding scheme comprises:
determining a highest precision from among any combination of the first precision, the second precision, and a target precision of the current block; and
rounding at least one of the first precision, the second precision, or the target precision to the highest precision.
7. The apparatus of claim 2, wherein the rounding scheme comprises:
determining a default precision; and
rounding at least one of the first precision, the second precision, or a target precision of the current block to the default precision.
8. The apparatus of any one of claims 1-7, wherein the pruning comprises discarding identical candidate MVs or sub-identical candidate MVs.
9. The apparatus of claim 8, wherein the pruning further comprises adding zero MVs to fill the candidate list.
10. The apparatus of any one of claims 1-9, wherein the processor is further configured to further perform the first rounding and the second rounding before the pruning.
11. The apparatus of any one of claims 1-9, wherein the processor is further configured to further perform the first rounding and the second rounding after the pruning.
12. The apparatus of any one of claims 1-11, wherein the candidate list is an advanced motion vector prediction (AMVP) candidate list, or wherein the candidate list is a merge candidate list.

13. The apparatus of any one of claims 1-12, wherein the processor is further configured to:
select a final candidate MV from the candidate list; and
signal the final candidate MV in an encoded video.
14. A method comprising:
obtaining a current block of a video frame;
obtaining candidate motion vectors (MVs) corresponding to neighboring blocks of the video frame, wherein the neighboring blocks neighbor the current block;
obtaining precisions of the candidate MVs;
performing first rounding of the precisions based on a rounding scheme;
performing second rounding of the candidate MVs based on the first rounding;
performing pruning of the candidate MVs; and
generating a candidate list based on the second rounding and the pruning.
15. The method of claim 14, wherein the neighboring blocks comprise a first neighboring block and a second neighboring block, wherein the precisions comprise a first precision of the first neighboring block and a second precision of the second neighboring block.
16. The method of claim 15, wherein the rounding scheme comprises:
rounding the first precision to a target precision of the current block, and rounding the second precision to the target precision; or
determining a third precision from among any combination of the first precision, the second precision, and a target precision of the current block, and rounding at least one of the first precision, the second precision, or the target precision to the third precision, wherein the third precision includes at least one of a lowest precision, a median precision, a highest precision, or a default precision.
17. The method of any one of claims 14-16, further comprising:
selecting a final candidate MV from the candidate list;
signaling the final candidate MV in an encoded video; and

transmitting the encoded video.

18. An apparatus comprising:

a receiver configured to receive an encoded video comprising a header for a portion of the encoded video, the header comprises a precision for all motion vectors (MVs) of a coding mode in the portion;

a processor coupled to the receiver and configured to decode the encoded video to obtain a decoded video based on the precision; and

a display coupled to the processor and configured to display the decoded video.

19. The apparatus of claim 18, wherein the portion is a slice, a region, a coding tree unit (CTU), or a tile.

20. The apparatus of claim 18 or 19, wherein the precision is one of quarter-pel precision, half-pel precision, integer-pel precision, or four-pel precision.