H.8.5.2.1.1 Derivation process for luma motion vectors for merge mode

This process is only invoked when PredMode[ xC ][ yC ] is equal to MODE\_SKIP or PredMode[ xC ][ yC ] is equal to MODE\_INTER and merge\_flag [ xP ][ yP ] is equal to 1, where ( xP, yP ) specify the top-left sample of the current luma prediction block relative to the top-left luma sample of the current picture.

Inputs of this process are

* a luma location ( xC, yC ) of the top-left sample of the current luma coding block relative to the top-left luma sample of the current picture,
* a luma location ( xP, yP ) of the top-left sample of the current luma prediction block relative to the top-left luma sample of the current picture,
* a variable nCS specifying the size of the current luma coding block,
* variables specifying the width and the height of the luma prediction block, nPbW and nPbH,
* a variable partIdx specifying the index of the current prediction unit within the current coding unit.

Outputs of this process are

* the luma motion vectors mvL0 and mvL1,
* the reference indices refIdxL0 and refIdxL1,
* the prediction list utilization flags predFlagL0 and predFlagL1,
* the disparity vector availability flags ivpMvFlagL0 and ivpMvFlagL1,
* the disparity vectors ivpMvDispL0 and ivpMvDispL1.
* the flag vspModeFlag, specifying, whether the current PU is coded using view synthesis prediction,
* the variable refViewIdx specifying a reference view for VSP,
* the flag availableFlagIvMC, specifying whether the IvMc candidate is available.

The variables singleMCLFlag is derived as follows.

* + If log2\_parallel\_merge\_level\_minus2 is greater than 0 and nCS is equal to 8, singleMCLFlag is set to 1.
  + Otherwise, singleMCLFlag is set to 0.

When singleMCLFlag is equal to 1, xP is set equal to xC, yP is set equal to yC, and both nPbW and nPbH are set equal to nCS.

NOTE – When singleMCLFlag is equal to 1, all the prediction units of the current coding unit share a single merge candidate list, which is identical to the merge candidate list of the 2Nx2N prediction unit.

The motion vectors mvL0 and mvL1, the reference indices refIdxL0 and refIdxL1, ~~and~~ the prediction utilization flags predFlagL0 and predFlagL1, the disparity vector availability flags ivpMvFlagL0 and ivpMvFlagL1, and the disparity vectors ivpMvDispL0 and ivpMvDispL1 are derived as specified by the following ordered steps:

* 1. The derivation process for spatial merge ~~ing~~ candidates ~~from neighboring prediction unit partitions~~ as specified in subclause G.8.5.2.1.2 is invoked with the luma coding block location ( xC, yC ), the coding block size nCS, the luma prediction block location ( xP, yP ), the variable singleMCLFlag, the width and the height of the luma prediction block nPbW and nPbH and the partition index partIdx as inputs and the output is assigned to the availability flags availableFlagN, the reference indices refIdxL0N and refIdxL1N, the prediction list utilization flags predFlagL0N and predFlagL1N and the motion vectors mvL0N and mvL1N with N being replaced by A0, A1, B0, B1 or B2.
  2. The reference index for temporal merging candidate refIdxLX (with X being 0 or 1) is set equal to 0.
  3. The derivation process for temporal luma motion vector prediction in subclause H.8.5.2.1.7 is invoked with luma location ( xP, yP ), the width and the height of the luma prediction block nPbW and nPbH, refIdxLX, and mergeFlag being equal to 1 as the inputs and with the output being the availability flag availableFlagLXCol, the temporal motion vector mvLXCol, and the reference index refIdxLXCol. The variables availableFlagCol and predFlagLXCol (with X being 0 or 1, respectively) are derived as specified below.
     + 1. availableFlagCol = availableFlagL0Col | | availableFlagL1Col (H‑85)   
          predFlagLXCol = availableFlagLXCol (H‑86)
  4. Depending on iv\_mv\_pred\_flag[ nuh\_layer\_id ], the following applies.
     + If multi\_view\_mv\_pred\_flag is equal to 0, the flags availableFlagIvMC and availableFlagIvDC are set equal to 0.
     + Otherwise (iv\_mv\_pred\_flag[ nuh\_layer\_id ] is equal to 1), the derivation process for the inter-view merge candidates as specified in subclause H.8.5.2.1.9 is invoked with the luma locations ( xC, yC ) and ( xP, yP ), the coding block size nCS, the variables nPSW and nPSH, and the partition index partIdx, as the inputs and the output is assigned to the view order index of the reference view refViewIdx, the availability flags availableFlagIvMC and availableFlagIvDC, the reference indices refIdxLXIvMC and refIdxLXIvDC, the prediction list utilization flags predFlagLXIvMC and predFlagLXIvDC, and the motion vectors mvLXIvMC and mvLXIvDC (with X being 0 or 1, respectively), and the disparity vector mvDisp.
  5. Depending on view\_synthesis\_pred\_flag, the following applies.
     1. [ Ed. (GT): The variable view\_synthesis\_pred\_flag is missing in software and HLS. ]
     + If view\_synthesis\_pred\_flag is equal to 0, or the DepthFlag is equal to 1, the flag availableFlagVSP is set equal to 0 and the variable refViewIdx is set equal to −1.
     + Otherwise (view\_synthesis\_pred\_flag is equal to 1), the derivation process for a view synthesis prediction merge candidate as specified in subclause H.8.5.2.1.12 is invoked with the luma locations ( xC, yC ) and ( xP, yP ), the coding block size nCS, the variables nPSW and nPSH, and the partition index partIdx as input and the outputs are the availability flag availableFlagVSP, the reference indices refIdxL0VSP and refIdxL1VSP, the prediction list utilization flags predFlagL0VSP and predFlagL1VSP, the motion vectors mvL0VSP and mvL1VSP, and reference view index refViewIdx.
  6. Depending on DepthFlag, the following applies.
     + If DepthFlag is equal to 0, the variable availableFlagT is set equal to 0.
     + Otherwise ( DepthFlag is equal to 1), the derivation process for the texture merging candidate as specified in subclause H.8.5.2.1.13 is invoked with the luma location ( xP, yP ), the variables nPSW and nPSH as the inputs and the outputs are the flag availableFlagT, the prediction utilization flags predFlagL0T and predFlagL1T, the reference indices refIdxL0T and refIdxL1T, and the motion vectors mvL0T and mvL1T.

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Insertion process for a candidate from a potentially view synthesis predicted neighbour block

Inputs of this process are

* a merge candidate list mergeCandList,
* a variable numMergeCand specifying the number of elements in mergeCandList,
* a candidate position indicator N
* a variable vspCandInListFlag specifying whether a VSP candidate is present in the list.
* a luma location ( xP, yP ) of the top-left sample of the current luma prediction block relative to the top-left luma sample of the current picture,
* variables nPbW and nPbH specifying the width and the height of the luma prediction block.

Outputs of this process are

* a potentially modified merge candidate list mergeCandList,
* a potentially modified variable numMergeCand specifying the number of elements in mergeCandList,
* a potentially modified variable vspCandInListFlag specifying whether a VSP candidate is present in the list.

The variable nbIsVspFlag is derived as specified in the following:

* If N is equal to A1 , the variable nbIsVspFlag is set equal to VspModeFlag[ xP − 1 ][ yP + nPbH − 1 ],
* Otherwise, if N is equal to B1 , nbIsVspFlag is set equal to VspModeFlag[ xP + nPbW − 1 ][ yP − 1 ],
* Otherwise, if N is equal to B0 , the variable nbIsVspFlag is set equal to VspModeFlag[ xP + nPbW ][ yP − 1 ],
* Otherwise, if N is equal to A0 , the variable nbIsVspFlag is set equal to VspModeFlag[ xP − 1 ][ yP + nPbH ],
* Otherwise, if N is equal to B2 , the variable nbIsVspFlag is set equal to VspModeFlag[ xP − 1 ][ yP − 1 ],
* Otherwise, ( N is equal to T ), the variable nbIsVspFlag is set to 0.

1. The variables mergeCandList, numMergeCand and vspCandInListFlag are modified as specified in the following:

* If nbIsVspFlag is equal to 0, the entry mergeCandList[ numMergeCand ] is set equal to N and the variable numMergeCand is increased by 1.
* Otherwise, ( nbIsVspFlag is equal to 1 ), when vspCandInListFlag is equal to 0, the following applies:
  + The variable vspCandInListFlag is set equal to 1.
  + The entry mergeCandList[ numMergeCand ] is set equal to VSP
  + The variable numMergeCand is set equal to (numMergeCand + 1)

H.8.5.2.1.13 Derivation process for the texture merging candidate

This process is not invoked when DepthFlag is equal to 0.

Inputs to this process are:

* a luma location ( xP, yP ) of the top-left luma sample of the current prediction unit relative to the top-left luma sample of the current picture,
* variables nPSW and nPSH specifying the width and the height, respectively, of the current prediction unit,

Outputs of this process are:

* a flag availableFlagT specifying whether the texture merging candidate is available,
* the prediction utilization flags predFlagL0T and predFlagL1T,
* the reference indices refIdxL0T and refIdxL1T (when availableFlagT is equal to 1),
* the motion vectors mvL0T and mvL1T (when availableFlagT is equal to 1).

The variable availableFlagT is set equal to 0. The variables predFlagL0T and predFlagL1T are set equal to 0. The variables refIdxL0T and refIdxL1T are set equal to −1. Both components of the motion vectors mvL0T and mvL1T are set equal to 0.

The texture luma location ( xRef, yRef ) is derived by:

* 1. xRef = Clip3( 0, PicWidthInSamplesL – 1, xP + ( ( nPSW – 1 ) >> 1 ) ) (H‑)
  2. yRef = Clip3( 0, PicHeightInSamplesL – 1, yP + ( ( nPSH – 1 ) >> 1 ) ) (H‑)
  3. [ Ed. (GT): Is clipping necessary? ]

Let textPic be the picture with PicOrderCntVal and ViewIdx equal to PicOrderCnt and ViewIdx of the current picture and DepthFlag being equal to 0 and let textPU the PU at covering the position ( xRef, yRef ) in textPic.

For X in the range of 0 to 1, inclusive, the following applies:

[Ed. (GT): It should be verified that the picture with refIdxLX is also a reference picture for depth. (#10)]

* 1. The variable textPredFlagLX is set equal to PredFlagLX of textPic. The variable textRefIdxLX is set equal to RefIdxLX of textPic. The variable textMvLX is set equal to the MvLX of textPic.
  2. When X is equal to 0 or the current slice is a B slice, the following applies:
     + When textPredFlagLX[ xRef ][ yRef ] is equal to 1, the following applies:
       1. mvLXT[ 0 ] = ( textMvLX[ xRef ][ yRef ][ 0 ] + 2 ) >> 2 (H‑)
       2. mvLXT[ 1 ] = ( textMvLX[ xRef ][ yRef ][ 1 ] + 2 ) >> 2 (H‑)
       3. refIdxLX = textRefIdxLX[ xRef ][ yRef ] (H‑)
       4. predFlagLXT = 1 (H‑)
       5. availableFlagT = 1 (H‑)
  3. When VspModeFlag[ xRef ][ yRef ] is not equal to 0, RefIdxLX is set to 0 when RefPicListX[ 0 ] is a long-term reference picture or AltRefIdxLX when RefPicListX[ 0 ] is a short-term reference picture.