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| *Title:* | **Adaptive MV precision for Screen Content Coding** | | |
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| *Purpose:* | Proposal | | |
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# Abstract

In this proposal, an adaptive MV precision method is proposed for screen content coding. A CU level flag is employed to indicate the MV precision of the CU. It is reported that 1%-4% luma BD rate reduction is achieved on average for screen content sequences. Coding gain is also observed for natural content sequences.

# Introduction

It is observed that sub-pixel MV precision is not always efficient for screen content and some range extension sequences (natural content). Therefore, adaptive MV precision is proposed in this contribution.

# Proposed method

It is proposed to signal a flag at CU level to indicate whether all PUs in the CU have integer-precision MVs. When the flag is on, MV predictors of PUs are rounded to integer precision and MV differrences are signaled in integer precision. When the flag is off, sub-pixel motion compensation is allowed.

The related syntax and semantics changes are as follows.

|  |  |
| --- | --- |
| coding\_unit( x0, y0, log2CbSize ) { | Descriptor |
| if( transquant\_bypass\_enabled\_flag ) |  |
| **cu\_transquant\_bypass\_flag** | ae(v) |
| if( slice\_type != I ) |  |
| **cu\_skip\_flag**[ x0 ][ y0 ] | ae(v) |
| nCbS = ( 1  <<  log2CbSize ) |  |
| if( cu\_skip\_flag[ x0 ][ y0 ] ){ |  |
| cu\_imv\_flag[ x0 ][ y0 ] | ae(v) |
| prediction\_unit( x0, y0, nCbS, nCbS ) |  |
| } |  |
| else { |  |
| … |  |
| **intra\_chroma\_pred\_mode**[ x0 ][ y0 ] | ae(v) |
| } |  |
| } else { |  |
| cu\_imv\_flag[ x0 ][ y0 ] | ae(v) |
| if( PartMode = = PART\_2Nx2N ) |  |
| prediction\_unit( x0, y0, nCbS, nCbS ) |  |
| … |  |
| } |  |
| } |  |
| } |  |
| } |  |

**cu\_imv\_flag**[ x0 ][ y0 ] equal to 1 specifies that motion vectors of all prediction units belonging to the current coding unit are in integer-pixel precision. cu\_imv\_flag[ x0 ][ y0 ] equal to 0 specifies that motion vectors of all prediction units belonging to the current coding unit are in quarter-pixel precision

When cu\_imv\_flag[ x0 ][ y0 ] is not present, it is inferred to be equal to 0.

# Simulation results and discussions

The proposed method was implemented on HM12.1RExt5.1. The test sequences and conditions defined by AhG 8 are used. The coding performance is summarized as follows.



It can be noticed that significant luma BD reduction is achieved for screen content sequences and non-negligible gains for natural content.

# Conclusions

In this contribution, adaptive MV precision method is proposed. Simulations show that significant coding gain is achieved for screen content sequences. It is proposed to establish a CE to further study the proposed method.

# Patent rights declaration(s)

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