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| *Title:* | **Improvement of CAVLC run- coding by prediction mode** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
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# Abstract

In this contribution, a scheme is proposed to run-level coding according to prediction mode of block. Simulation shows that the scheme has -0.2%/-0.1%/0.0% coding performance improvements with intra, low delay and random access low complexity configuration respectively. Moreover, no additional complexity is observed for all tests.

# Introduction

In the current HM3.0, block type is classified as U, V, inter Luma, intra Luma. U and V coefficients in the run coding are coded using *cn = xRunLevelIndInter(lev, run, maxrun)*[1]. We propose run- coding for intra or inter regardless of considering Luma or Chroma. In the middle of Y,U,V coding sequentially, they use the same function which increase the cache hit-ratio. It gives a benefit for complexity reduction and simplification.

# Proposal

The difference of run-coding in both HM3.0 and proposed one is depicted in Figure 1. In the current HM, intra Luma coefficients are coded using *xRunLevelInd()*, others are coded using *xRunLevelIndInter().* The proposed scheme only checks the block type as inter or intra not to subdivide. We introduce an *IsIntra* flag to signal whether it is intra or inter as shown in the below code.

#if PROPOSAL

If(isIntra) // Intra Luma + Intra Chroma

#else

if(n==2 || n==5 ) // Intra Luma only

#endif

{

cn = xRunLevelInd(lev, run, maxrun, pLumaRunTr1[tr1][tmprun]);

}

else

{

cn = xRunLevelIndInter(lev, run, maxrun);

}

xWriteVlc( vlc, cn );

where n=0 (U), n=1 (V)





**Figure 1 Comparisons of HM3.0 and Propose method**

# Experimental Results

The proposed run-coding based on prediction mode of a block was implemented on HM3.0. Three low complexity tests are performed under the common test condition described in JCTVC-C500[2]. The experimental results are summarized in Table 1.

   

**Table 1 Results on run-coding by prediction mode**

# Conclusion

This proposal is the improvement of CAVLC run-coding by prediction mode of block type as inter or intra. An experimental result shows that this modification provides improved coding performance for all test sequences consistently without additional complexity.

# References

1. M. Karczewicz, X.Wang, W.-J. Chien, “CE5: coefficient coding with LCEC for large blocks”, JCTVC-E384, Geneva, CH, March. 2011..
2. Frank Bossen, “Common test conditions and software reference configurations”, JCTVC-C500, JCT-VC 3rd Meeting, Guangzhou, October 2010.

# Specification

JCTVC-E603\_d8 Section 9.2.4.3

* The parsing process described in subclause 9.2.1 is invoked with vlcNum as input and the variable codeNum as output~~. If blockType is equal to 2 or blockType is equal to 5,~~ the value of run\_level\_one is derived as follows.
* The parsing process described in subclause 9.2.1 is invoked with vlcNum as input and the variable codeNum as output*. If pred mode of block is Intra*, the value of run\_level\_one is derived as follows.

# Patent rights declaration(s)

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