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| *Title:* | On TextureRL flag context | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
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# Abstract

This contribution proposes to modify context for TextureRL flag. In the proposed context derivation, coding unit size is used instead of top and left neighbouring TextureRL flags in the purpose of removing dependencies with neighbouring regions. Experimental results show that the impacts on the luma bdrates are; AI 2x: 0.04%, AI 1.5x: 0.02%, RA 2x: 0.07%, RA 1.5x: 0.09%, RA SNR: 0.02%, LP 2x: 0.08%, LP 1.5x: 0.15%, and LP SNR: 0.02%.

# Introduction

In the recent SHVC test model (SHM1) [1], TextureRL flag (texture\_rl\_flag) is used to signal whether the so-called inter-layer texture prediction is applied to the specific coding unit. In SHM1, the CABAC context for texture\_rl\_flag is derived as the sum of TextureRL flags in the top and left neighbouring regions. More specifically, Table 1 shows the context derivation of texture\_rl\_flag in SHM1.

Table 1. Specification of ctxIdxInc using left and above syntax elements in SHM1

|  |  |  |  |
| --- | --- | --- | --- |
| **Syntax element** | **condL** | **condA** | **ctxIdxInc** |
| texture\_rl\_flag | texture\_rl\_flag [ xL ][ yL ] | texture\_rl\_flag [ xA ][ yA ] | ( condL && availableL ) + ( condA && availableA ) |

In HEVC design, referring syntax elements of the neighbouring regions are not preferred since it causes memory increase to store those syntax elements. In addition, availability checks of the neighbouring regions are needded during the parsing process. Therefore, the context derivation method independent of information in neighbouring regions is useful also for texture\_rl\_flag.

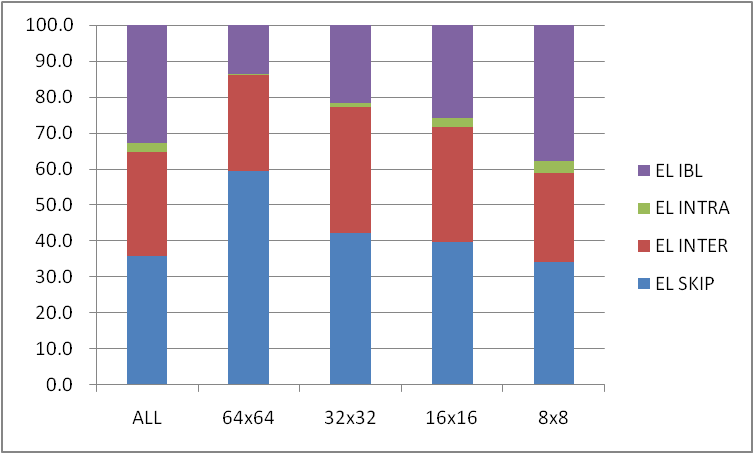
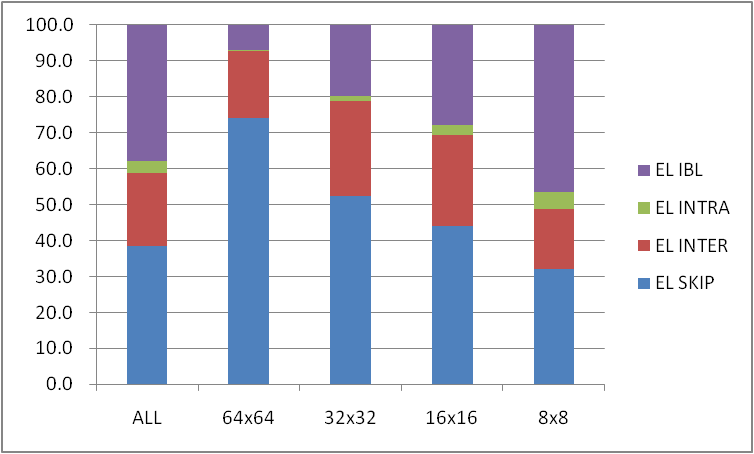
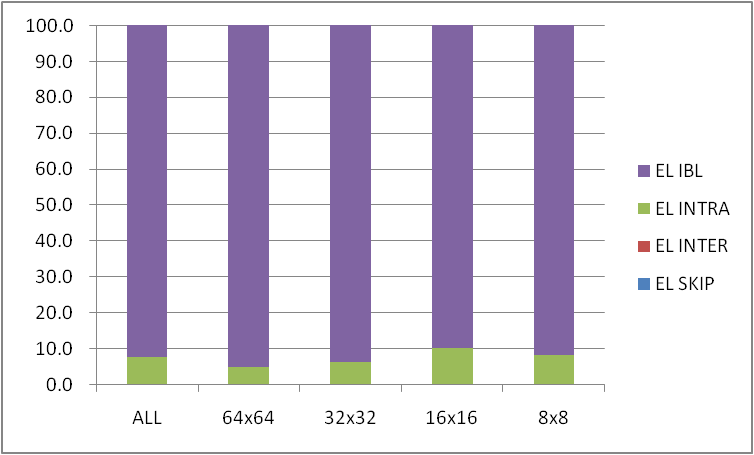
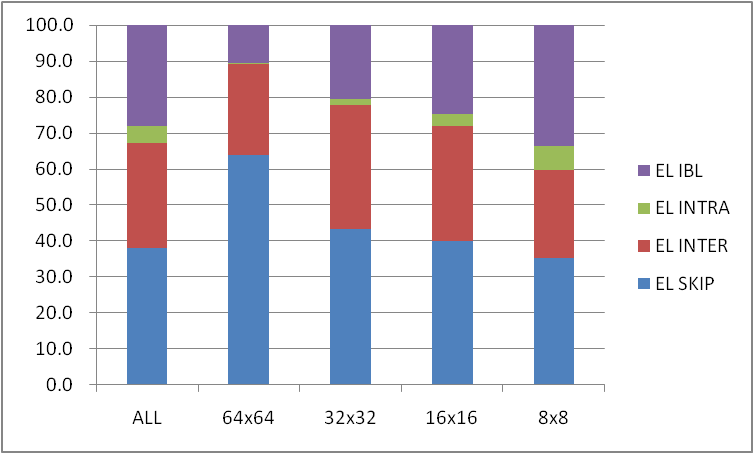
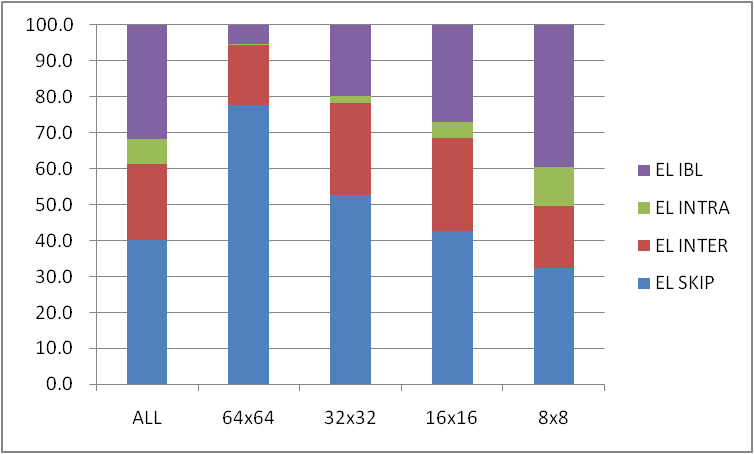
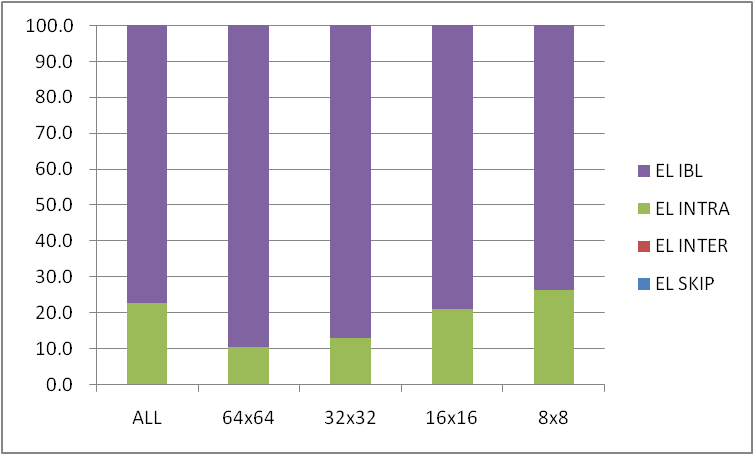
# Proposed method

We propose the CU-size dependent context for texture\_rl\_flag. More precisely, CtDepth of the current CU is used to derive ctxIdxInc. The association between ctxIdxInc and CtDepth are shown in Table 2. It also contains corresponding CU sizes when CtbSizeY is 64x64 and MaxCuDepth is 3. The number of contexts is three, which is the same as that of SHM1.

Table 2. Association between contexts (ctxIdxInc) and CU sizes in the proposed method

|  |  |  |
| --- | --- | --- |
| CtDepth | ctxIdxInc | Note  (corresponding CU size) |
| 0,  1 (< MaxCuDepth-1) | 0 | 64x64 /  32x32 |
| 2 (MaxCuDepth-1) | 1 | 16x16 |
| 3 (MaxCuDepth) | 2 | 8x8 |

We think it is reasonable to determine context of texture\_rl\_flag based on CU sizes since the statistics of texture\_rl\_flag reveals it depends on CU sizes as shown in Figure 1.



(a) AI 2x

(b) RA 2x

(c) LP 2x

(d) AI SNR

(e) RA SNR

(f) LP SNR

Figure 1. CU types distributions in SHM1 enhancement layer   
(EL IBL corresponds to the ratio of CU coded with TexturRL prediction)

# Experimental results

The proposed method is implemented on SHM-1.0 reference software. Table 3 shows the performance of the modified software evaluated based on SHVC common test condition [2]. Luma bdrate change compared to anchor (SHM-1.0) is as follows; AI 2x: 0.04%, AI 1.5x: 0.02%, RA 2x: 0.07%, RA 1.5x: 0.09%, RA SNR: 0.02%, LP 2x: 0.08%, LP 1.5x: 0.15%, and LP SNR: 0.02%. The proposed context modification does not introduce significant impact on coding efficiency.

Table 3: Performance of the proposed method (ref. SHM-1.0)



# Conclusion

This contribution proposes to modify context for TextureRL flag. In the proposed context derivation, coding unit size is used instead of top and left neighbouring TextureRL flags in the purpose of removing dependencies with neighbouring regions. Experimental results show that the impacts on coding efficiency is not significant. Since the proposed method can reduce both processing and memory needed for Texture RL flag context derivation, it is recommended to evaluate the proposed context derivation in CE.

# Reference

1. J. Chen, J. Boyce, Y. Ye, M. M. Hannuksela, “SHVC Test Model 1 (SHM 1)”, JCTVC-L1007, Geneva, Switzerland, 14–23 Jan. 2013.
2. X. Li, J. Boyce, P. Onno, Y. Ye, “Common SHM test conditions and software reference configurations”, JCTVC-L1009, Geneva, Switzerland, 14–23 Jan. 2013.

# Patent rights declaration(s)

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