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| *Title:* | **CE3: Cross-check of Sony's proposal E128** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
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| *Source:* | Nokia | | |

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# Abstract

This contribution is the cross check report for the Sony proposal JCTVC-E128 in CE3.

# Introduction

Within CE3, several proposals are made in the area of motion compensation interpolation to (i) improve the coding efficiency and/or (ii) reduce the complexity. JCTVC-E128 proposes to use different filters for uni and bi predictive cases. For uni-prediction case, the proposal utilizes a separable 6-tap filter for half-pixel samples and a separable 5-tap filter for quarter-pixel samples. For bi-prediction a separable filter with 8-taps are used . The filter coefficients are given as:

Filter coefficients for uni-prediction:

Half pixel: [ 2, -7, 37, 37, -7, 2]

Quarter pixel: [-3, 50, 21, -6, 2]

Filter coefficients for bi-prediction:

Half pixel: [-2, 5, -11, 40, 40,-11, 5, -2]

Quarter pixel: [-1, 4, -10, 58, 18, -7, 3, -1]

It is argued in JCTVC-E128 that a sharp filter for bi-prediction is helpful. The frequency responses for both filters are shown as follows (for half-pixel case):



# Experimental Results

The experimental results are given as follows (the reliable decoding times will be added):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Random access |  |  | Random access LoCo |  |
| Y BD-rate | U BD-rate | V BD-rate | Y BD-rate | U BD-rate | V BD-rate |
| Class A | 0.1 | 0.2 | 0.3 | -0.9 | -0.1 | -0.1 |
| Class B | 0.0 | 0.0 | 0.0 | -0.6 | -0.3 | -0.4 |
| Class C | -0.1 | -0.3 | -0.3 | -0.4 | -0.3 | -0.3 |
| Class D | 0.1 | -0.4 | -0.3 | -0.3 | -0.6 | -0.4 |
| Class E |  |  |  |  |  |  |
| All | 0.0 | -0.1 | -0.1 | -0.6 | -0.3 | -0.3 |
| Enc Time[%] |  | | |  | | |
| Dec Time[%] |  | | |  | | |
|  |  |  |  |  |  |  |
|  | Low delay | | | Low delay LoCo | | |
|  | Y BD-rate | U BD-rate | V BD-rate | Y BD-rate | U BD-rate | V BD-rate |
| Class A |  |  |  |  |  |  |
| Class B | 0.2 | 0.3 | 0.3 | -0.7 | 0.1 | 0.0 |
| Class C | -0.2 | 0.1 | 0.0 | -0.9 | -0.2 | 0.1 |
| Class D | 0.1 | 0.3 | 0.6 | 0.0 | 0.1 | 0.6 |
| Class E | 0.0 | -0.1 | 0.5 | -0.7 | 0.7 | 1.1 |
| All | 0.0 | 0.2 | 0.3 | -0.6 | 0.1 | 0.4 |
| Enc Time[%] |  | | |  | | |
| Dec Time[%] |  | | |  | | |

# Findings and recommendations

The proposal improves the low complexity configuration by 0.6% on average and does not have a visible coding efficiency impact on high efficiency. Due to using lower filter-taps, the average complexity is reduced and the worst case complexity is not changed.

# Patent rights declaration(s)

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