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of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC
29/WG 11**

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Abstract

The adoptions on LFNST in the 17th JVET meeting had resolved complexity issues in LFNST, which led the following two features: 1) an LFNST index can be signalled in the case that Luma CBF (Coded Block Flag) is zero and Chroma coefficient distribution is compatible with LFNST in single-tree case, and 2) Chroma coefficient distribution shall be compatible with LFNST in single-tree case although LFNST is only applied to Luma in single-tree case. Here, the compatibility with LFNST indicates that coefficients should be properly zeroed-out for LFNST and at least one non-zero coefficient should exist at a position other than DC.

In this contribution, three alternative LFNST index signaling methods are proposed to remove one or all of the two features as follows:

Method 1: Simple addition of a condition to (A) coding_unit or (B)/(C) residual_coding syntax table, in order to prevent the signaling in the case of zero Luma CBF

Method 2: Enabling Chroma LFNST in single-tree case

Method 3: LFNST index signaling in transform_unit syntax table

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LINKS

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JVET-R0318

<http://vexpertise.stbit.ru/documents/JVET-R0318>

JVET Search

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Alternative methods of LFNST index signalling

Authors:

ABSTRACT

MEETING NOTES



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Document Information

Submitted by: Joon-Paeng Ohm

Title: Alternative methods of LFNST index signalling

Authors: V. Sengul

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Associated Resources

Comments



ARCHIVE

archive v3

https://jvet-experts.org/doc_end_user/documents/18_Alpbach/wg11/JVET-R0318-v3.zip

PDF

JVET-Q0318_presentation-v1.pdf

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JVET-R0318-v2.docx

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XLS

JVET-R0318_Method_1_A.XLSM

XLS

JVET-R0318_Method_1_B.XLSM

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JVET-R0318_Method_1_C.XLSM

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JVET-R0318_Method_2.XLSM



MEETING NOTES

external meeting notes

https://www.itu.int/wftp3/av-arch/jvet-site/2020_04_R_Alpbach/JVET-R_Notes_dH.docx

Joint Video Experts Team (JVET)
of ITU-T SG21 WP3/21 and ISO/IEC JTC 1/SC 29
18th Meeting: Teleconference, April 2020

Document: JVET-R0318

Title: Meeting Report of the 41st Meeting of the Joint Video Experts Team

Status: Report document from the chair of JVET

Purpose: Report

1 Summary



MEETING NOTES

[JVET-R0318](#) Alternative methods of LFNST index signalling [M. Koo, M. Salehifar, J. Lim, S. Kim (LGE)]

The adoptions on LFNST in the 17th JVET meeting had resolved complexity issues in LFNST, which led the following two features: 1) an LFNST index can be signalled in the case that Luma CBF (Coded Block Flag) is zero and Chroma coefficient distribution is compatible with LFNST in single-tree case, and 2) Chroma coefficient distribution shall be compatible with LFNST in single-tree case although LFNST is only applied to Luma in single-tree case. Here, the compatibility with LFNST indicates that coefficients should be properly zeroed-out for LFNST and at least one non-zero coefficient should exist at a position other than DC.

In this contribution, three alternative LFNST index signalling methods are proposed to remove one or all of the two features as follows:

- Method 1: Simple addition of a condition to (A) coding_unit or (B)/(C) residual_coding syntax table, in order to prevent the signalling in the case of zero Luma CBF
- Method 2: Enabling Chroma LFNST in single-tree case
- Method 3: LFNST index signalling in transform_unit syntax table

Method 1 removes the first feature, and others both of the two features. And, Method 1 and Method 2 incur minimal changes of spec, but Method 3 requires the fairly amount of spec changes. The BD-rate changes of Y/U/V are summarized as follows:

- Method 1: (A) 0.00%/0.00%/0.00% (AI) and -0.01%/-0.01%/-0.02% (RA),
(B) 0.00%/0.00%/0.00% (AI) and -0.01%/-0.01%/0.01% (RA)
(C) 0.00%/0.00%/0.00% (AI) and -0.02%/-0.03%/-0.02% (RA)
- Method 2: 0.00%/0.00%/0.00% (AI) and -0.04%/-0.19%/-0.27% (RA)
- Method 3: 0.00%/0.00%/0.00% (AI), -0.02%/-0.04%/-0.06% (RA), and 0.00%/0.00%/0.00% (LD)

According to the experimental results of Method 1 and Method 3, both of the two feature make little impact on coding performance. Furthermore, Method 2 increases complexity due to the Chroma LFNST in single-tree case. It is recommended that 1) no action should be taken on current LFNST index signalling if it is thought that the two features do not incur any critical issues, or 2) Method 1 or Method 2 could be adopted if more conservative approaches are preferable, or 3) Method 3 could be considered if group is not concerned about considerable spec changes.

Similar to JVET-R0057, JVET-R0174, JVET-R0236 – see notes there.

No need for discussion, according to proponents

No action was taken on this.

CITATION

M. Koo, M. Salehifar, J. Lim, S. Kim, "Alternative methods of LFNST index signalling", JVET-R0318, 18th Meeting: Teleconference, April 2020.

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2. [B. Heng, T. Hellman, M. Zhou, W. Wan, "AHG16: Combination of LFNST with transform skip", JVET-Q0106, 17th Meeting: Brussels, January 2020.](#)
3. [T. Hashimoto, T. Chujoh, E. Sasaki, T. Ikai, "Fix on LFNST condition", JVET-Q0133, 17th Meeting: Brussels, January 2020.](#)
4. [H.E. Egilmez, A. Nalci, A.K. Ramasubramonian, M. Coban, V. Seregin, M. Karczewicz, T. Hashimoto, T. Chujoh, E. Sasaki, T. Ikai, "Combination of JVET-Q0106, JVET-0686 and JVET-Q0133 for LFNST Signaling, Latency Reduction and Scaling Process", JVET-Q0784, 17th Meeting: Brussels, January 2020.](#)
5. [B. Bross, J. Chen, S. Liu, Y.-K. Wang, "Versatile Video Coding \(Draft 8\)", JVET-Q2001, 17th Meeting: Brussels, January 2020.](#)